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A STATISTICAL INQUIRY CONCERNING DOMESTIC SERVICE.

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During the summer of 1888 a statistical inquiry concerning domestic service was begun by the department of history, Vassar College. The investigation grew out of a belief that, while much had been written in regard to domestic servants, there had been little serious study of domestic service. No investigation of the question had been made by the United States Bureau of Labor, and of the twenty-two state bureaus only two had given any attention to the subject, and in both cases only partial reports had been made. In the reports of a few other bureaus the subject had been treated incidentally in connection with the general question of woman wage-earners. Its exclusion from statistical presentations of the labor questions had not been surprising since the various bureaus of labor, both national and state, consider only those subjects for the investigation of which there is a recognized demand. They are the leaders of public opinion in the accumulation of facts, but they are its followers as regards

choice of questions to be studied. Public opinion has not yet demanded a scientific treatise on domestic service, and until it does the bureaus of labor cannot be expected to supply the material for such discussion. In default of statistical and industrial information concerning domestic service as an occupation, the personal element in the relationship of employer and employe has been made the basis of all propositions for securing an improvement in the service. It was with the view, therefore, of ascertaining some of the industrial conditions under which domestic service is given and received that three schedules were prepared, one to be filled out by employers, one by employes, and a third miscellaneous in character.

The schedule for employers called for four kinds of information. The first related to servants, and included facts concerning the kind of service in which they were employed, the number so employed, place of birth, time in the service of their present employers, the amount of wages and rate of payment, and whether with or without board, the actual number of hours engaged in work, free time allowed each week, and vacation granted during the year, and whether with or without loss of wages. The second class of facts desired related to the industrial conditions under which service is given. They comprised information regarding the community, whether residence was in a city, village, suburb, or in the country, the leading industries of the locality, and to what extent women had been employed in these industries. The third class of facts sought concerned industrial conditions within the household, and included the length of time the employer had kept house, the number of servants employed during that time, the length of time boarded, the number of persons in the family, and whether the wages paid were higher or lower than during previous years. The fourth class of questions called for expressions of opinion as to the nature of the service rendered, whether it had been excellent, good, fair, or poor; whether it had been found difficult to secure

good domestic service, and what explanation of the difficulty could be given.

The schedule sent employes called for two classes of answers. The first concerned the facts relating to place of birth, the number of years engaged in domestic service, the length of time with present employer, the number of previous employers, wages received, the highest and lowest wages received from previous employers, whether the employe had ever been engaged in any occupation besides domestic service, and, if so, the nature of the employment, with a statement of the highest and lowest wages received in it. The second class of answers expected concerned the reasons why housework had been chosen as an occupation, what reasons could be given why more women do not choose domestic service as a regular employment, and whether the employe would give up housework if another kind of work paying equally well could be found.

The third schedule asked for information in regard to training schools for domestic employes, public and private schools where household employments are taught, women's exchanges, co-operative housekeeping, food prepared at home for sale elsewhere, housework done by the piece or by the hour by persons other than regular servants, and a statement as to how far the results had been remunerative.

The schedules were printed and submitted to Hon. Carroll D. Wright and to Mr. C. F. Pidgin, whose work on "Practical Statistics" had been of help in making the original draft. These gentlemen gave valuable suggestions, and, after several printed revisions, twenty-five hundred sets of the blanks were distributed in January, 1889. They were sent out in packages of from five to twenty-five through the members of the class of 1888, Vassar College, and also through personal acquaintances. As a sufficient number of replies was not received, a second edition of twenty-five hundred sets was sent out in December, 1889. These were distributed through the class of 1889, and sets were also mailed, with a statement

of the object of the work, to the members of different associations presumably interested in such investigations. These were the American Statistical Association, the American Economic Association, the Association of Collegiate Alumnæ, the Vassar Alumnæ, and the women graduates of the University of Michigan. They were also sent to various women's clubs, and many were distributed at the request of persons interested in the work.

Of the five thousand sets of blanks thus sent out, 1025 were returned filled out by employers, twenty being received after the tabulation was completed. These gave the facts asked for with reference to 2545 employes. The returns received from employers thus bore about the same proportion to the blanks distributed as do the returns received in ordinary statistical investigation carried on without the aid of special agents or legal authority. The reasons why a larger number was not returned are the same as are found in all such inquiries, with a few peculiar to the nature of the case. The occupation investigated is one that does not bring either employer or employe into immediate contact with others in the same occupation, and it is therefore believed that the relations between employer and employe are purely personal, and thus not a proper subject for statistical inquiry. Another reason assigned was the fear that the agitation of the subject would cause employes to become dissatisfied, while a third reason was the large number of questions included in the blanks, and the fact that no immediate and possibly no remote benefit would accrue to those filling them out. Another reason frequently assigned was that all of the questions could not be answered, and that, therefore, replies to others could not be of service. But several of the questions were framed with the understanding that in many cases they could not be definitely answered, as the question "How many servants have you employed since you have been housekeeping?" The fact that often no reply could be given was as significant of the condition of the service as a detailed statement could have been.

No success had been anticipated in securing replies from employes, but as any study of domestic service would be incomplete without looking at it from this point of view the attempt was made. As a result 719 blanks were returned filled out. In some instances employes hearing of the inquiry wrote for schedules and returned them answered. In a few cases correspondence was carried on with women who had formerly been in domestic service. The influences that operated to prevent employers from answering the inquiries made had even greater force in the case of employes. In addition there was present a hesitation to commit anything to writing or to sign a name to a document the import of which was not clearly understood by them.

The limited number of facts concerning which information could be given explains the small number of returns received to the third schedule,—about two hundred. The material thus secured will not be considered in this paper since it relates to subjects allied to domestic service rather than to the service itself.

The returns received were sent to the Massachusetts Bureau of Statistics of Labor, where, by the courtesy of the Chief of the Bureau, they were collated during the spring and summer of 1890 under the special direction of the chief clerk in accordance with a scheme of tables designed and presented by the writer. The general plan of arrangement adopted was to class the schedules with reference to employers, first alphabetically by states and towns, and second alphabetically by population. The schedules were then classed with reference to employes, first by men and women, and second by place of birth. The various statistical devices used in the Massachusetts Bureau were employed in tabulating the material and greatly facilitated the work, but it was at best a long and tedious process.

Fifty large tables were thus prepared, and by various combinations numerous smaller ones were made. The classification adopted made it possible to give all the results either in

a general form, or with special reference to men and women employes, the native born and the foreign born, and to all of the branches of the service. It was also possible to study the conditions of the service geographically, and with reference to the population and other industrial situations.

The most detailed tables made out concerned the wage question, including a presentation of classified wages, average wages with the percentage of employes receiving the same wages as the average and also more or less than the average, a comparison of wages paid at different times and of wages received in domestic service and in other employments. For the purposes of comparison, the writer also classified the salaries paid about six thousand teachers in the public schools in sixteen representative cities, as indicated by the reports of city superintendents for the year during which information concerning domestic service had been given on the schedules. Through the courtesy of a large employment bureau in Boston the wages received by nearly three thousand employes were ascertained and used for comparison. The most valuable results of the investigation possibly were those growing out of the consensus of opinion obtained from employers and employes regarding the nature of the service considered as an occupation.

The question must naturally arise as to how far the returns received through such investigation can be considered representative, and, therefore, how far it is wise for private individuals to undertake them on so extensive a scale. It is this phase of the subject rather than the more immediate problems affecting domestic service that this paper concerns.

It has seemed to the writer that the returns could be considered fairly representative. Investigations of this character must always be considered typical rather than comprehensive. It is difficult to fix the exact number to be considered typical as between a partial investigation and a census which is exhaustive. In some cases it is possible to obtain a majority in numbers, in others it is not. If the number of returns,

however, passes the point where it would be considered trivial, the number between this and the majority may perhaps be regarded as representative. By the application of a similar principle, the expression at the polls of the will of the twentieth part of the inhabitants of a state is recognized as the will of the majority. But, while the returns can be considered only fairly representative as regards numbers, they seem entirely so as regards conditions. It is believed that every possible condition under which domestic service exists, as regards both employer and employe, is represented by the returns received, and that therefore the conclusions drawn from these results cannot be wholly unreasonable. Moreover, the circulars were sent out practically at random, and therefore do not represent any particular class in society, except the class sufficiently interested in the subject to answer the questions asked. If the returns thus secured can be regarded in any sense as representative, the results based on them may be considered as indicating certain general conditions and tendencies, and, although the conclusions reached may be modified by later and fuller researches, they cannot be wholly overthrown.

Some specific reasons also lead to the same conclusion that the schedules may be used to denote conditions and tendencies.

The average family reached through the schedules numbered 4.86 persons. This does not vary materially from five, — the usual basis assumed.

It was found through the schedules that, of the total number of domestic employes represented, women formed 82 per cent and men 18 per cent. By the census of 1880 — unfortunately the latest available for this comparison — it was found that women formed 88 per cent of domestic employes and men 12 per cent. The slight discrepancy is explained by the fact that on the schedules choremen, furnace men, and other men employed in the house were classed as domestic

servants, while in the census enumeration they were denominated laborers.

The place of birth of employes represented on the schedules was as follows: —

TABLE I.

PLACE OF BIRTH OF EMPLOYES.

Person Reporting.	Number.			Percentages.		
	Native Born.	Foreign Born.	Not Given.	Native Born.	Foreign Born.	Not Given.
Employer.....	922	1,212	411	36.23	47.62	16.15
Employe.....	324	395	....	45.06	54.94	.....

This shows that more than half the number considered were of foreign birth. In Massachusetts in 1885 the foreign born domestic servants formed 60.24 per cent of the entire number. This included only those persons in housework "engaged with remuneration."[1] In the Tenth Census of the United States it is found that, after eliminating the southern and border sections where the domestic servants are almost exclusively native born negroes, more than one-third of all domestic employes, 34.31 per cent, were, in 1880, of foreign birth.[2] As the ranks of domestic service have been recruited from the army of immigrants coming to this country since 1880, it is perhaps not unfair to assume that the above table represents the present tendency towards the employment as domestic servants of persons of foreign birth, especially in those sections most affected by foreign immigration.

The schedules also indicated the foreign countries having the largest representation in domestic service, as is seen by the following table: —

[1] *Census of Massachusetts, 1885.* Part 2, pp. xxxvii-xxxviii.
[2] *Tenth Census.* Vol. I, p. 729.

TABLE II.

NUMBER OF FOREIGN BORN IN DOMESTIC SERVICE.

Place of Birth.	Person Reporting.			
	Employer.		Employe.	
	Number.	Per Cent.	Number.	Per Cent.
Ireland	653	53.88	217	54.94
Sweden and Norway	147	12.13	50	12.66
Germany	128	10.56	37	9.37
Great Britain	122	10.07	32	8.10
British America	104	8.58	42	10.63
Other countries	58	4.78	17	4.30
Total	1,212	100.00	395	100.00

The condition of the service as regards place of birth did not vary materially from this in 1880, as is evident from the following table which indicates the place of birth of all persons of foreign birth engaged in domestic service and the per cent of each nationality so engaged: —

Ireland,	47.73
Germany,	16.97
British America,	8.62
Great Britain,	7.61
Sweden and Norway,	7.45
Other Countries,	11.62

The variations of this table from Table II are indeed a confirmation of the representative character of the former. The relative rank of Sweden and Norway is much lower in the table drawn from the Census than in that taken from the schedules. But the emigration from Sweden and Norway had steadily declined from 1869 to 1879[1] and this materially affected the number in domestic service as given in the Tenth Census. In 1879 emigration from these countries revived and increased more than 25 per cent, reaching a maximum in 1882. This increase in numbers has shown itself in

[1] *Arrivals of Alien Passengers and Immigrants in the United States from 1820 to 1890*, pp. 24-25.

domestic service, for in the proportion of women arriving in this country from 1881 to 1890, inclusive, Ireland ranks first, Germany second, Sweden and Norway third, and England fourth.[1] It has been noted in various census reports, national and state, that the concentration of women of foreign birth engaged in remunerative occupations is on domestic service. It is also true that, considering the proportion of persons coming to the United States at the age when persons most naturally enter domestic service,— between fifteen and forty-five,— Ireland ranks first, Sweden and Norway second, England third, and Germany fourth.[2]

A second variation of Table II from the census returns concerns the percentage of persons born in "other countries." But here again the variation proves rather the representative character of the schedules. It is impossible to state the exact number of Chinese in domestic service in 1880, owing to the defective classification of occupations in the census of 1880, but presumably the 11.62 per cent in domestic service born in "other countries" are Chinese.[3]

Another indication of the general representative character of the schedules comes from their geographical distribution. Replies were received from thirty-six states and the District of Columbia and from 338 different cities and towns. Of these 338 places 38 are classed by the Census Bulletin No. 52 as among the fifty largest cities in the United States in

[1] *Ibid*, p. 9. [2] *Ibid*, p. 10.

[3] This assumption is made because the total number of men engaged in the occupation at that time is given as 136,745. Of these 102,230 were born in the United States, and 17,516 in either Ireland, Germany, Great Britain, Norway, Sweden, or British America. Those born in "other countries" number 16,999, or twelve per cent of the entire number of men in domestic service. Among women those born in "other countries" form only one per cent of the entire number of women in domestic service. As China is the only country not specifically enumerated in the census in which men are to any considerable extent engaged in domestic service, it is fair to assume that the 11.62 per cent born in "other countries" are mainly Chinese. At the time represented by the schedules the prohibitory act of 1888 was in force, and after the restriction act of 1882 the immigration to this country from China had been nominal. Between 1848 and 1876 the average annual departures had formed 40 per cent of the number of arrivals (*R. M. Smith, Emigration and Immigration*, p. 237), and if this same rate of departures was subsequently maintained, in 1889–1890 the number of Chinese in this country must have been comparatively small. It seems probable, therefore, that the percentage born in "other countries," 4.3, as represented on the schedules, was approximately correct. In view of these facts, Table II may be said to represent fairly well the distribution of the foreign born among the different nationalities.

1890. These thirty-eight cities contained 16.32 per cent of the total population of the United States in 1890. These cities were represented on the schedules by 999 employes, or 39.25 per cent of the total number of employes concerning whom reports were received from employers. This would seem to show that the force of gravity exerted by the large cities acts with more than twice the power on the class of domestic employes that it does on population as a whole. A comparison is possible here between these facts and similar ones presented by the census of 1880. In that year the fifty largest cities contained 15.53 per cent of the total population of the country, but they contained 27.91 per cent of the total number of domestic servants. The influence exerted by the large cities on domestic employes was thus at that time nearly twice that exerted on the total population. But it is seen by the Eleventh Census bulletins that the urban population has increased during the last decade more rapidly than during any previous one, and it is perhaps fair to assume that the attraction exerted by them on domestic employes has increased in the same ratio.

Some interesting facts were also ascertained in regard to wages, showing the general conformity of wages in domestic service to the principles governing wages in other industries. The following table shows the average wages received in different sections,— the general average being used in this place merely for convenience: —

TABLE III.

AVERAGE WEEKLY WAGES BY GEOGRAPHICAL SECTION.

Geographical Section.	Average Weekly Wages.	
	Men.	Women.
Pacific coast	$7.57	$4.57
Eastern section	8.68	3.60
Middle section	7.62	3.21
Western section	6.69	3.00
Border section	4.86	2.55
Southern section	3.95	2.22
The United States	$7.18	$3.23

The classification of sections was made with reference to conditions apparently similar as regards domestic service. The Pacific Coast included California, Colorado, Nevada, Utah, and Washington; the Eastern Section, Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; the Middle, New York, New Jersey, and Pennsylvania; the Western, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin; the Border, District of Columbia, Kentucky, Maryland, Tennessee, and Virginia; the Southern, Alabama, Florida, Louisiana, Mississippi, North Carolina, South Carolina, and Texas. The differences in wages noted in Table III apparently conform to the general variation in wages in the different sections as indicated by the Fourth Annual Report of the Commissioner of Labor,[1] and also by an examination of a considerable number of reports of state bureaus of labor. The slight exception in the case of the wages of men on the Pacific coast is accidental, and due undoubtedly to the comparatively small number of returns received.

It was also found that in domestic service, as in other occupations, skilled labor commands higher wages than unskilled labor. This will be evident from the following table based on the schedules received from employers and employes and the returns from a Boston employment bureau.

In every instance it is seen that it is the skilled laborer — the cook — who commands the highest wages. The general servant who is expected to unite in herself all the functions of all the other employes named in the list becomes, on account of this fact, an unskilled workman, and, therefore, receives the lowest wages. The same principle holds true in the case of the seamstress and the laundress, the gardener and the choreman. It is difficult to make a deduction in the case of men employed in household service since no universal custom prevails, as with women employes, in regard to adding to the wages paid in money, board, lodging, and other personal expenses.

[1] P. 68.

TABLE IV.

AVERAGE WEEKLY AND DAILY WAGES BY OCCUPATIONS.

Occupation.	Weekly Wages.		
	General Schedule of		Boston Employment Bureau.
	Employer.	Employe.	
WOMEN.			
Cook	$3.80	$3.64	$4.45
Parlor maid	.....	.....	3.94
Cook and laundress	3.50	3.27	.....
Chambermaid	3.31	3.47	3.86
Waitress	3.23	3.15	3.76
Second girl	3.04	3.27	3.34
Chambermaid and waitress	2.99	3.21	.....
General servant	2.94	2.88	3.16
MEN.			
Coachman	7.84	.....	.....
Coachman and gardener	6.54	.....	.....
Butler	6.11	.....	.....
Cook	6.08	.....	.....
	Daily Wages.		
WOMEN.			
Seamstress	$1.01	.....	.....
Laundress	.82	.....	.....
MEN.			
Gardener	1.33	.....	.....
Choreman	.87	.....	.....

It also seems to be true in domestic service as elsewhere that the skilled laborer does his work better than the unskilled workman. The question was asked of employers, "What is the nature of the service rendered? Is it 'excellent,' 'good,' 'fair,' or 'poor?'" The replies show that, in proportion to the number of answers, the largest percentage of service characterized as "excellent" is rendered by cooks, while the largest percentage characterized as "poor" is given by general servants. These are, it is true, matters of opinion and without a fixed standard, which it is impossible to secure; such judgments can have no absolute value. But the fact is of interest as showing the opinion of a large number of house-

keepers. The following table will show the results in regard to these two classes of employes: —

TABLE V.

NATURE OF SERVICE RENDERED.

Occupation.	Total Number of Replies.	Not Answered.	Kind of Service Rendered.							
			Excellent.		Good.		Fair.		Poor.	
			Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Cooks.....	262	30	83	32	113	43	58	22	8	3
General servants...	585	53	151	26	221	38	177	30	36	6

It was also found that the wages of men engaged in domestic service are higher than the wages of women. This will be seen by reference to Table III and Table IV. Two things, however, must be borne in mind: first, that nearly all the men classified as cooks are employed on the Pacific coast where wages are relatively high; second, that 40 per cent of men in domestic service do not receive board and lodging in addition to cash wages, while only two per cent of women so employed, principally colored women and laundresses, do not receive board and lodging. But, although these facts modify the discrepancy between the wages of men and women, they do not wholly remove it. Whether the difference is as great as in other occupations cannot be stated.

There was also found a slight tendency towards an increase in wages paid by employers, as is seen by this table: —

TABLE VI.

COMPARISON OF WAGES PAID.

Wages Paid.	Number.			Percentage.		
	Men.	Women.	Total.	Men.	Women.	Total.
Same as last year.....	414	1,638	2,052	87.72	79.02	80.63
More than last year.....	54	368	422	11.44	17.75	16.58
Less than last year.....	4	67	71	.84	3.23	2.79

Much has been said in regard to the immobility of labor as an obstacle in the way of the industrial advancement of women. It was found by the schedules, however, that this obstacle does not exist in domestic service in respect either to immobility of place or to immobility of occupation. It has been seen that the number of foreign born domestics form 47 per cent of the entire number as reported by employers, and 55 per cent as reported by employes. It was also found that of the native born employes 27 per cent did not reside in the same state in which they were born. More than two-thirds, therefore, of all employes concerning whom the facts were stated did not reside in the country or state in which they were born. Moreover, this statement is below the truth as it does not take into account the number of changes made within a single state, and considers only one change from place of birth to present residence. An illustration of this latter point is seen in the case of one employe who was born in Ireland, engaged in service in New York, removed to Chicago with her employer and afterwards drifted to Minnesota, where the report was made. The mobility as to employment was found to be nearly as great. Twenty-eight per cent of employes reported that they had been engaged in other occupations, while 50 per cent expressed a readiness to go into some other employment provided it would pay them as well as domestic service. It is of interest to note some of these occupations from which women have gone to domestic service. The list includes apparently nearly every form of work in every kind of mill and factory, farm work, cigar-making, sewing, dress-making, millinery, tailoring, crocheting, lace-making, carpet making, copying, places as cash-girls, sales-women, nurses, post-office clerks, compositors, office-attendants; six had been teachers; others, ladies' companions, governesses, and matrons. It is of interest also to note that the per cent of native born women who have been engaged in other occupations is slightly higher than the per cent of foreign born,— thirty-one to twenty-five.

If a comparison is made between these facts and those

presented in the Fourth Annual Report of the Commissioner of Labor on Working Women in Large Cities, it will be found that the mobility of place is less among working women of the class represented by the Report than among domestic employes. This is due largely to the fact that foreign born women enter domestic service in greater numbers than they do other occupations. The Report shows that of the native born women 20 per cent do not reside in the state in which they were born.[1] The Report also shows that 45 per cent of the women represented had been engaged in some previous occupation.[2] Domestic service thus does not differ materially in point of mobility from other occupations in which women are engaged, if the factor of foreign birth is eliminated. Employers have come to believe that more stability rather than more mobility should be encouraged in this occupation.

These general reasons and specific illustrations have been given in order to show that while the returns received through the schedules can in no sense be considered an exhaustive presentation of the subject of domestic service, or even of a single phase of it, they may be used to indicate fairly well certain present conditions and tendencies.

Some of these conditions and tendencies have been suggested in the facts already given. Other industrial conditions may be shown through other tables.

One of the most striking conditions of the service, especially in view of the unwillingness of many persons to enter it, is the fact that the wages received are relatively and sometimes absolutely higher than the average wages received in other wage-earning occupations open to women. This has been suggested by previous tables, but will be more evident from the following detailed tables: —

[1] P. 249. [2] P. 325.

Occupations. Schedule of Employers.	Under $1.	$1, but under $2.	$2, but under $3.	$3, but under $4.	$4, but
WOMEN.					
General servants	1	33	251	276	
Second girls	....	17	50	76	
Cooks and laundresses	....	4	21	70	
Cooks	4	6	38	104	
Chambermaids and waitresses	2	9	44	69	
Chambermaids	1	6	18	45	
Waitresses	....	3	43	32	
Nurses	1	11	30	46	
Housekeepers	....	....	....	1	
Total	9	89	495	619	2
MEN.					
Butlers	....	3	2	5	
Coachmen and gardeners	....	2	7	11	
Coachmen	....	1	5	8	
Cooks	....	1	....	1	
Total	....	7	14	25	
WOMEN.					
Laundresses	123	121	....	....	..
Seamstresses	48	51	6	....	..
Total	171	172	6	....	..
MEN.					
Gardeners	26	87	8	1	..
Choremen	24	14	1	....	..
Total	50	101	9	1	..
Schedule of Employes.					
General servants	1	16	152	187	
Second girls	....	....	11	18	
Cooks and laundresses	....	4	6	22	
Cooks	1	3	20	39	2
Chambermaids and waitresses	....	....	6	15	
Chambermaids	....	1	7	9	
Waitresses	....	2	14	16	
Nurses	....	1	5	10	
Housekeepers	....	....	....	2	
Total	2	27	221	318	

TABLE VII.

D DAILY AND WEEKLY WAGES BY OCCUPATIONS.

Earning Weekly.

under $3.	$3, but under $4.	$4, but under $5.	$5, but under $6.	$6, but under $7.	$7, but under $8.	$8, but under $9.	$9, but under $10.	$10, but under $11.	$11, but under $12.	$12, but under $13.	$13, but under $14.	Over $14.	Total.
51	276	39	5	....	1	....	....	....	....	....	....	....	606
50	76	18	4	1	4	....	....	....	....	....	...	....	170
21	70	41	5	....	....	....	....	....	....	....	....	....	141
38	104	86	31	7	....	....	3	1	....	....	....	....	280
44	69	7	2	....	....	....	....	....	....	....	....	....	133
18	45	18	4	....	....	....	....	....	....	....	....	....	92
43	32	23	2	....	....	....	....	....	....	....	....	....	103
30	46	18	9	....	6	....	....	4	....	....	....	....	125
..	1	2	....	....	....	1	....	....	....	....	....	....	4
95	619	252	62	8	11	1	3	5	....	....	....	....	1,654
2	5	3	8	6	4	3	6	2	1	....	1	....	44
7	11	18	22	21	3	12	10	11	4	1	1	....	123
5	8	10	14	17	3	9	12	7	11	3	6	3	109
..	1	3	2	3	3	1	3	....	....	....	....	....	17
14	25	34	46	47	13	25	31	20	16	4	8	3	293

Earning Daily.

..	....	....	....	....	....	....	....	....	....	....	....	....	244
6	....	....	....	....	....	....	....	....	....	....	....	....	105
6	....	....	....	....	....	....	....	....	...	....	....	....	349
8	1	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....
9	1	....	...	....	....	....	....	....	....	....	....	....	161

Earning Weekly.

2	187	24	3	....	....	....	....	....	....	....	....	....	383
1	18	10	....	....	....	....	....	....	....	....	....	....	39
6	22	13	....	....	....	....	....	....	....	....	....	....	45
0	39	23	11	3	1	....	....	....	....	....	....	....	101
6	15	1	1	....	....	....	....	....	....	....	....	....	23
7	9	6	1	....	....	1	....	....	....	....	....	....	25
4	16	1	2	1	....	....	....	....	....	....	....	....	36
5	10	1	1	....	....	....	....	....	....	....	....	....	18
.	2	1	....	....	....	....	1	....	....	....	....	....	4
1	318	80	19	4	1	1	1	....	....	....	....	....	674

TABLE VIII.[1]

AVERAGE WEEKLY AND DAILY WAGES BY OCCUPATIONS.

Occupation.	Person Replying.					
	Employer.			Employe.		
	Average Weekly Wages.	Per Cent Receiving More than the Average.	Per Cent Receiving the Same or Less than the Average.	Average Weekly Wages.	Per Cent Receiving More than the Average.	Per Cent Receiving the Same or Less than the Average.
WOMEN.						
General servants	$2.94	52.97	47.03	$2.88	55.87	43.13
Second girls	3.04	40.00	60.00	3.27	53.85	46.15
Cooks and laundresses	3.50	43.97	56.03	3.27	53.33	46.67
Cooks	3.80	45.71	54.29	3.64	43.56	56.44
Chambermaids and waitresses	2.99	58.65	41.35	3.21	52.17	47.83
Chambermaids	3.31	47.83	52.17	3.47	32.00	68.00
Waitresses	3.23	43.69	56.31	3.15	44.44	55.56
Nurses	3.53	36.00	64.00	3.03	33.33	66.67
Housekeepers	5.15	25.00	75.00	5.15	25.00	75.00
Total	$3.23	47.88	52.12	$3.11	50.95	49.05
MEN.						
Butlers	$6.11	50.00	50.00	.....	.....	.....
Coachmen and gardeners	6.54	44.72	55.28	.....	.....	.....
Coachmen	7.84	46.79	53.21	.....	.....	.....
Cooks	6.09	47.06	52.94	.....	.....	.....
Total	$6.93	46.42	53.58	.....	.....	.....
	Average Daily Wages.					
WOMEN.						
Laundresses	$0.82	53.28	46.72	.....	.....	.....
Seamstresses	1.01	39.05	60.95	.....	.....	.....
Total	$0.90	49.00	51.00	.....	.....	.....
MEN.						
Gardeners	$1.33	56.56	43.44	.....	.....	.....
Choremen	.87	43.59	56.41	.....	.....	.....
Total	$1.29	53.42	46.58	.....	.....	.....

[1] In the classification in these two tables the employes in several large boarding houses were omitted. All of those included under the term "nurses" are nurse-girls, with the exception of the few receiving the highest wages.

The following tables also show the classified and average wages paid in the principal occupations as reported by a Boston employment bureau:—

TABLE IX.

CLASSIFIED WEEKLY WAGES BY OCCUPATIONS.

Occupation.	Earning Weekly.										
	$1, but under $2.	$2, but under $3.	$3, but under $4.	$4, but under $5.	$5, but under $6.	$6, but under $7.	$7, but under $8.	$8, but under $9.	$9, but under $10.	$10, but under $11.	Total.
General servants...	8	183	577	143	3	....	....	....	....	....	914
Second girls.....	2	41	363	69	....	....	....	....	....	....	475
Cooks.....	1	3	39	347	145	28	4	3	....	4	574
Chambermaids.....	....	3	40	37	2	....	....	....	....	....	82
Waitresses.....	....	4	29	16	1	....	....	....	....	....	50
Parlor maids.....	....	....	11	45	1	....	....	....	....	....	57
Nursery maids.....	7	45	119	57	3	1	1	....	....	....	233
Laundresses.....	....	1	9	27	15	1	....	....	....	....	53
Total.....	18	280	1,187	741	170	30	5	3	....	4	2,438

TABLE X.

AVERAGE WEEKLY WAGES BY OCCUPATIONS.

Occupation.	Average Weekly Wages.	Per Cent Receiving More than the Average.	Per Cent Receiving the Same or Less than the Average.	Highest Wages Received.	Lowest Wages Received.	Total Number.
General servants.	$3.16	40.5	59.5	$5.00	$1.50	914
Second girls.....	3.34	62.2	37.8	4.50	1.50	475
Cooks.....	4.45	50.0	50.0	10.50	1.00	574
Chambermaids...	3.86	57.4	42.6	5.00	3.00	82
Waitresses.....	3.76	48.4	51.6	5.00	2.50	50
Parlor maids.....	3.94	80.4	19.6	5.00	3.50	57
Nursery maids....	3.26	51.3	48.7	7.00	1.00	233
Laundresses.....	4.44	44.4	55.6	6.00	2.00	53
Total.....						2,438

It is seen from Table VIII that the average weekly wages in domestic service are $3.23,— a fair average in this case, since 48 per cent receive more than the average and 52 per cent the same or less than the average. The average domestic employe, therefore, is able to earn in money during the year $167.96, — a fair estimate, since in seventy-five cases out of every hundred the vacation granted women employes during the year is given without loss of wages. This forms, however, but a part of the annual earnings. To this sum must be added board and lodging, fuel and light. For the equivalent in quality and quantity to that furnished by the employer the employe would in general be obliged to pay for board, lodging, and other incidental expenses at a reasonable estimate five dollars per week, or $250 annually, deducting board for two weeks' vacation. The total annual earnings of a domestic employe, therefore, amount to nearly $420. To this the negative facts must be added that there is no expense for laundry work, and that the work involves few personal expenses in the way of clothing, and that these necessary expenses are often partially met through gifts from the employer. Again, the position entails no expenditures for car fares in going to and from work, or other demands made in a business way by other occupations, and it involves no outlay for appliances for work as a sewing machine, typewriter, text-books, etc. Moreover, no investment of capital is necessary in learning the principles of the work, since employers have thus far been willing to make of their own homes training-schools for employes. The domestic employe is therefore never obliged to pay back either the capital invested in preparing for her work or the interest on that amount. It thus seems possible for the average household employe to save annually nearly $150 in an occupation involving no outlay or investment of capital in any way, and few or no personal expenses.

A comparison may be made between these wages and the annual salaries received in sixteen representative cities by

the women teachers in the public schools. The following tables show the annual classified and average salaries received[1]:—

TABLE XI.

CLASSIFIED ANNUAL SALARIES OF WOMEN TEACHERS.

City.	EARNING ANNUALLY.											
	Under $300.	$300, but under $400.	$400, but under $500.	$500, but under $600.	$600, but under $700.	$700, but under $800.	$800, but under $900.	$900, but under $1,000.	$1,000, but under $1,200.	$1,200, but under $1,500.	More than $1,500.	Total.
Albany, N. Y.....	1	26	34	153	22	11	6	....	....	1	....	254
Atlanta, Ga.....	7	1	32	31	3	4	1	....	....	2	....	81
Baltimore, Md....	....	....	628	246	101	1	1	40	3	....	....	1,020
Cambridge, Mass.	....	1	22	19	146	10	3	11	2	....	....	214
Cincinnati, Ohio..	....	....	26	50	59	359	98	1	5	19	2	619
Cleveland, Ohio..	....	....	119	124	269	89	16	8	14	10	4	653
Detroit, Mich....	....	54	63	111	20	121	35	5	3	14	1	427
Lawrence, Mass..	....	....	43	49	6	....	2	1	1	1	....	103
Lowell, Mass.....	....	....	8	5	155	9	1	....	....	1	1	180
Milwaukee, Wis..	....	2	76	72	197	19	7	15	9	2	....	399
New Haven, Conn	....	54	73	38	107	14	11	....	1	2	1	301
New Orleans, La.	2	172	174	3	18	7	....	5	1	....	....	382
Paterson, N. J....	....	55	97	26	8	9	2	....	....	....	....	197
Rochester, N. Y..	45	57	287	3	7	14	6	....	1	2	....	422
St. Louis, Mo....	61	36	182	362	122	133	42	20	12	13	13	996
Syracuse, N. Y...	....	35	52	139	21	3	13	1	....	....	....	264
Total.....	116	493	1,916	1,431	1,261	803	244	107	52	67	22	6,512

The concentration of salaries is seen to be on those between $400 and $500, the average salary being $545. This sum represents the full amount of wages received. To ascertain the amount it is possible to save annually there must be deducted at least $260 for board and lodging, and $25 for laundry expenses, leaving a cash balance of $260. Out of this sum, however, must come other necessary expenses, as

[1] The figures are taken from the annual reports of city superintendents. The attempt was made to find the average salaries in the fifty largest cities, but many cities do not publish in detail the salaries paid. The reports used were those for the year ending in 1889,— the year for which reports were made through the schedules,— with the exception of Paterson where the report for 1890 was used. Half-day teachers are omitted as far as known. In cities having separate schools for colored and white children, the teachers in colored schools are included where the salaries paid are the same as those paid in white schools of the same grade,— otherwise they are omitted.

TABLE XII.

AVERAGE ANNUAL SALARIES OF WOMEN TEACHERS.

City.	Average Salary.	Per Cent Receiving More than the Average.	Per Cent Receiving the Same or Less than the Average.
Albany, N. Y.	$505.73	27.70	72.30
Atlanta, Ga.	459.05	48.12	51.88
Baltimore, Md.	500.92	37.12	62.88
Cambridge, Mass.	628.35	22.32	77.68
Cincinnati, Ohio.	702.87	20.60	79.40
Cleveland, Ohio.	625.60	43.20	56.80
Detroit, Mich.	607.96	96.02	3.98
Lawrence, Mass.	511.16	26.22	73.78
Lowell, Mass.	608.66	6.71	93.29
Milwaukee, Wis.	588.00	63.59	34.41
New Haven, Conn.	536.41	52.96	47.04
New Orleans, La.	429.78	28.08	71.92
Paterson, N. J.	455.20	22.84	77.16
Rochester, N. Y.	431.63	57.34	42.66
St. Louis, Mo.	574.68	34.89	65.11
Syracuse, N. Y.	494.98	67.04	32.96

the outfit for work, as books, stationery, etc., travelling expenses, car fares, society fees, etc., and a large item for clothing. There should also be deducted the interest on the capital invested in securing the education demanded in preparation for the work. If all of these items are considered, and the greater social demands entailed by the position, it seems possible for the average domestic employe to save at least as much money as the average teacher in the city schools. This comparison is probably relatively higher in favor of the teacher than it should be, since in the average wages for domestic employes are included the wages received in agricultural districts where wages are lower than in cities. It is also a comparison between skilled workers on the one hand, and on the other hand an occupation in some of the subdivisions of which the laborers are unskilled.

It has, unfortunately, not been possible to compare the wages received in the same city by teachers and domestic employes. A comparison, however, can be made between the wages received in Boston for domestic service and by the

teachers in the public schools in the neighboring city of Cambridge.

The average wages received by a cook in a private family in Boston are, as has been seen by Table X, $4.45. This judgment is based on 574 returns, and is an exact average, since 50 per cent receive more than that amount, and 50 per cent the same or less than that. She therefore earns annually $231.40 plus $275 for board, lodging, fuel, light, and laundry expenses, or $506.40.

Fifty-six per cent of the teachers in the city schools in Cambridge earn annually $620, or, deducting $285 for board, etc., for fifty-two weeks, $335 in money. This is $103 more than is received by the Boston cook, but out of this must come numerous expenses entailed by the position from which the domestic employe is exempt. The cash annual savings in the two cases cannot vary materially.

It will also be seen by reference to Tables X and XII that the Boston cook earns absolutely more than does the average city teacher in Albany, Atlanta, Baltimore, New Orleans, Paterson, Rochester, and Syracuse.

A second comparison is suggested by the investigations conducted by the Department of Labor. Through these it was found that the average annual earnings of the working-women in twenty two typical cities are $272.45.[1] This average takes into consideration time lost,—a factor which does not enter into domestic employments except in a casual way. The annual earnings, therefore, of the class of women represented by the report are much less than those of the domestic employe. The same point is also illustrated by a comparison of the amounts saved in the two occupations. In eleven cities investigated by the Department of Labor the average amount saved was less than $50; in nine cities it was $50, but under $100, while in only two cities was it more than $100, the highest average amount being $111.[2] The highest of these

[1] *Fourth Annual Report*, pp. 520–529.
[2] *Ibid*, p. 625.

averages is small in comparison with the amount it is possible to save in domestic service, as has been suggested.

No question in regard to earnings saved was asked on the schedule sent to employes, but many statements on this point were voluntarily made by employes. One writes, "I have put $100 in the savings-bank in a year and a half. I had at first $10 a month, but now I have $12." Another states, "I can save more in domestic service than in any other kind of work." A third says, "My expenses are less than in any other work." An employe who receives $35 per month states, "I choose housework in preference to any other principally because for that I receive better pay. The average pay for store and factory girls is eight and nine dollars a week. After paying for board and room-rent, washing, etc., very little is left, and what is left must be spent for dress,— nothing saved."

The question as to comparative amounts saved has also been asked the cashiers of banks in small cities and towns where factories are found, and the personnel of depositors is known by the officials of the banks. No records are of course kept, but the opinion has been several times expressed that the factory employes are not as saving, as a class, as are domestic servants. In one place where about 2000 factory employes are found, it was stated that no woman employe had a sum to her credit as large as had been deposited by a domestic.

The conclusion seems to follow that high wages are not the only determining factor in the choice of an occupation.

Another interesting fact in regard to wages is shown through Tables VII and IX, that while the wages paid in domestic service are on the average high, the occupation offers few opportunities for advancement in this direction. The tables show but five instances, with the exception of nurses,[1] where the weekly cash wages reach $10 per week, and only

[1] The returns for this class are somewhat confused, information being given in some instances in regard to trained nurses, and in others, the majority of cases, concerning nursery maids.

seven others where they rise above $8 per week. In the two occupations, the wages in which have been compared with those in domestic service, while the general average wages are low, it is possible to reach through promotion a comparatively high point. The fact that the plain of average wage in domestic service is a high one is an inducement for women of ordinary ability to enter the occupation. On the other hand, the fact that the wage limit is soon reached, must act as a barrier in the case of many who are specially ambitious.

It has been stated that wages received in domestic service are not affected by the vacation granted during the year, since in the majority of cases no deduction in wages is made where a short vacation is given. The following tables illustrate this:—

TABLE XIII. VACATION GRANTED DURING THE YEAR.

Reported by Employes.	Women.		Men.	
	Number.	Per Cent.	Number.	Per Cent.
Total number of employes	2,073	....	472	....
Not reported	898	....	267	....
Not applicable (laundresses, etc.)	203	....	50	....
Reported and applicable	972	....	155	....
Vacation granted	971	....	153	....
Time not specified	202	20.78	34	21.94
Less than one week	127	13.07	42	27.10
One week	150	15.43	18	11.61
More than one week, less than two	25	2.57	5	3.22
Two weeks	210	21.61	33	21.29
More than two weeks	257	26.44	21	13.55
No vacation	1	.10	2	1.29

TABLE XIV. VACATION GRANTED WITH OR WITHOUT LOSS OF WAGES.

Reported by Employers.	Women.		Men.	
	Number.	Per Cent.	Number.	Per Cent.
With loss of wages	210	21.63	20	13.07
Without loss of wages	723	74.46	133	86.93
Half wages	37	3.81	....	....
Cost of board added	1	.10	....	....
Total	971		153	

A short vacation granted during the year without loss of wages has in many localities come to be regarded by employes as one of the prerogatives of the occupation, and not, as formerly, a special privilege given. All things considered, it is a matter of surprise that so much rather than that so little time is given. In other occupations a vacation can be granted employes during a dull season without loss to the employer. But the household machinery cannot stop action without disaster. A vacation to household employes means that the employer must perform a double amount of domestic work, or provide for special assistance,— often a difficult and even impossible task.

It is also true that employers, as a rule, grant employes a certain amount of free time each week. Reports were given on this point in regard to 1672 employes, and in only 43 cases was this privilege not granted. But apparently no uniform custom prevails in regard to the specific time in the week thus given. It was found that different employers had made 123 classes of combinations of the seven afternoons and seven evenings of the week, thus disproving the common belief that the custom is universal of granting Thursday afternoon and Sunday evening. In 68 of the classes mentioned, one or more afternoons are included, and in 15 others some portion of Sunday. In the case of more than a thousand employes, at least one afternoon each week is given, while more than four hundred employers give a part of Sunday.

The statement has been made that in only a limited number of instances is board not included in the wages paid women employes. The following list shows the only instances reported of both women and men employes: —

Second girls,	2	Butlers,	1
Cooks and laundresses,	1	Coachmen and gardeners,	52
Laundresses,	39	Coachmen,	45
Chambermaids and waitresses,	1	Gardeners,	76
Chambermaids,	1	Choremen,	12
Waitresses,	1		

In addition to board, which is considered a part of the wages paid, and annual vacation without loss of wages and free time each week, which are considered prerogatives of the place rather than special privileges, many employers grant special favors not of necessity implied in the engagement made with employes. To the question asked employers, "Do you grant any special privileges?" 30 answered "No," and 175 give no answer; 800 enumerated special privileges, and these formed 68 different classes. The most important of these were single rooms, medical care and attendance when sick, use of daily papers, books and magazines, evening instruction, sitting-room for visitors, no restriction as to visitors, use of bath-room, sewing-machine, and horse and carriage when distant from church, seat in church and at table, except when guests were present. Many other privileges are mentioned, but these are the ones most frequently granted. 70 per cent of employers state that they furnish each employe a single room; but one-half of this number employ only one domestic. In many cases a large room is given for every two domestics, with separate furniture for each. 146 employers specify the use of the dining-room, and 94 families give the use of a special sitting-room. All of these favors shown indicate that, with the single exception of a seat at the family table, the domestic is as much a part of the family she serves as is the average boarder of the household in which he resides.

The attempt was made to ascertain the actual working hours in domestic service. No complaint is more often made than of irregularity in this particular, and the results as given below seem to justify the judgment.

The table represents, moreover, only the general irregularities in working hours. The question is complicated by the industrial and social conditions in every household. Ten hours may represent in one family the average daily working hours, but the actual working hours may be for five consecutive days eight, nine, ten, eleven, and twelve. It is the irregularity in the distribution of working time rather than the

TABLE XV.

ACTUAL DAILY WORKING HOURS.

Occupation.	Number Working					Not Answered.	Total.	Per Cent Working				
	10 Hours.	11 Hours.	12 Hours.	Less than 10 Hours.	More than 12 Hours.			10 Hours.	11 Hours.	12 Hours.	Less than 10 Hours.	More than 12 Hours.
WOMEN.												
General servants	149	28	91	142	45	183	638	32.75	6.15	20.00	31.21	9.89
Second girls	29	6	26	40	21	52	174	23.77	4.92	21.31	32.79	17.21
Cooks and laundresses	25	7	21	21	26	42	142	25.00	7.00	21.00	21.00	26.00
Cooks	58	9	41	45	43	92	288	29.59	4.59	20.92	22.97	21.94
Laundresses	94	11	16	36	3	91	251	58.75	6.88	10.00	22.50	1.87
Chambermaids, waitresses	34	4	20	21	20	36	135	34.34	4.04	20.20	21.21	20.20
Chambermaids	23	3	10	17	6	37	96	38.98	5.09	16.95	28.81	10.17
Waitresses	46	3	2	7	10	39	107	67.65	4.41	2.94	10.29	14.71
Nurses	25	8	25	8	19	45	130	29.41	9.41	29.41	9.41	22.35
Seamstresses	57	2	4	26	....	18	107	64.04	2.25	4.50	29.21	....
Housekeepers	....	....	....	1	....	4	5	....	....	....	....	....
Total	540	81	256	364	193	639	2,073	37.66	5.65	17.86	25.38	13.45
MEN.												
Butlers	11	....	10	5	7	13	46	33.34	....	30.30	15.15	21.21
Coachmen and gardeners	31	8	26	20	10	35	130	32.63	8.42	27.37	21.05	10.53
Coachmen	27	4	18	5	10	48	112	42.19	6.25	28.13	7.81	15.62
Gardeners	52	6	12	23	8	25	126	51.49	5.94	11.88	22.77	7.92
Choremen	7	1	2	11	3	17	41	29.17	4.17	8.33	45.83	12.50
Cooks	7	....	3	3	1	3	17	50.00	....	21.43	21.43	7.14
Total	135	19	71	67	39	....	472	40.79	5.74	21.45	20.24	11.78

Per Cent Working	Women.	Men.
Ten hours	37.66	40.79
Less than ten hours	25.38	20.24
More than ten hours	36.96	38.97

amount of time demanded that causes dissatisfaction on the part of employes. It is difficult to see how this objection to domestic service can ever be wholly overcome, although undoubtedly the irregularities in many households could be somewhat lessened were the subject carefully considered. "You are mistress of no time of your own," writes one em-

ploye; "other occupations have well defined hours after which one can do as she pleases without asking anyone."

The question was asked of employes: "What reasons can you give why more women do not choose housework as a regular employment?" The reasons assigned may be classified as follows: —

Pride, social condition, and unwillingness to be called servants.	157	Girls are too lazy,	8
Confinement evenings and Sundays,	75	Health considerations,	8
More independence in other occupations,	60	Girls are too restless,	6
Too hard and confining,	42	Too few privileges,	6
Other work pays better,	42	Hard work, little pay,	5
Lack of consideration by mistresses,	38	Other occupations easier,	4
Hours too long,	38	Different tastes,	4
Do not like housework,	19	Bad character of some, reflects on others,	3
Do not know how to do housework,	12	Receive no encouragement,	3
Can live at home by working in shops,	11	Too lonely and meals alone,	3
		Constant change in work,	3
		Shop work cleaner,	2
		No chance for promotion,	2
		Miscellaneous reasons, one each	11
		Total,	562

Only one of the reasons given above, "lack of consideration by mistresses," concerns the personal relationship existing between employer and employe, and only 38 persons out of 562, or 7 per cent of the entire number, assign this as an objection to domestic service. The reasons that apparently weigh most heavily against domestic service as an occupation are the industrial and social conditions under which it is performed. The conclusion must follow that any attempt to improve domestic service by bringing about merely better personal relations between mistress and maid must fall far short of reaching the end desired. No improvement is possible which is not based on a thorough study of the actual, not theoretical, objections to the employment as they exist in the minds of employes in comparison with the objections found to other occupations.

The question was asked of employers: "What explanation of the difficulty (of securing good domestic servants) can you give?" The replies may be classed as follows[1]: —

Fault of employes,	432
Economic reasons,	408
Fault of employers,	218
Social reasons,	121
No difficulty exists,	45
Total,	1224

The question was also asked of employers: "How do you think the difficulty could be lessened or removed?" These replies may be thus classed: —

Applying the Golden Rule,	277
Training schools for servants,	242
Better supervision,	138
Elevating domestic service,	99
Better gradation of wages,	91
Co-operation,	61
Better business relations between mistress and maid,	49
Withholding recommendations from incompetent help,	39
Teaching housework in the public schools,	25
Different kinds of immigration,	20
Service books as in Germany,	12
Simpler mode of living,	12
Miscellaneous reasons,	25
	1090

It is not the object of this paper to discuss the reasons given by employers in explanation of existing difficulties or the remedies proposed by them. It must suffice to call attention to the discrepancies between the reasons urged by employes against domestic service as an occupation, and the remedies proposed by employers for removing the difficulties they have observed. The belief is sometimes forced upon

[1] One other class of replies received ought to be noted. One of the clerks who assisted in the tabulation reported one morning, "I find eighteen long answers containing no information." The difficulty experienced in the tabulation is undoubtedly sometimes found in the household,— long directions given by the employer, hopeless confusion in the minds of others as to what is really desired.

one that in no other occupation have so many and such varied measures of relief been proposed after so slight a diagnosis of the case.

The investigation of this subject and the discussion of the results obtained by means of it have not been considered a final settlement of the perplexing questions connected with domestic service. It is not believed that all, or even one of these questions can be settled as a result of it. But the investigation has been made as a special plea for a more scientific study of the subject on the part of the general public than it has yet received, for a recognition of its place in the industrial field on the part of statisticians and economic specialists. It is an ambitious hope that in time the great labor bureaus, always ready to anticipate any demand of the public for a scientific investigation of labor questions, will recognize a demand for work in this direction, and thus present far more satisfactory material to be used as a basis for subsequent discussion than has been possible through the work of an individual student.

THE THEORY AND PRACTICE OF PRICE STATISTICS.

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There has often been noted in the development of statistical science a wide divergence between the theoretical, professorial treatment of the subject and the views of practical statisticians. This divergence has been frequently a direct conflict of opinion. At other times it has seemed rather that the connection between the work of the theorist and the practical man has been wanting. The latter has drawn no principles of action from the doctrines of theoretical writers, and he has been loath to believe that the cause of statistics has been strengthened by them. He knows full well that the general public for whom his labors are primarily intended has no knowledge of these speculations nor interest in them. In consequence of this fact theory and practice have developed side by side, and any reflex action which one may have exerted upon the other has proceeded almost exclusively from practice, and very little from theory. The explanation of this fact may be due to the circumstance that what has frequently been called theory is not in any sense distinct from practice, but merely a refinement of the precepts of experience. If, however, there is any distinct theory of statistics, it should accord not only with the practice of working statisticians, but should indicate clearly and distinctly the general lines along which all successful statistical effort should be conducted. In his *History, Theory and Technique of Statistics*,* Prof. Meitzen believes that he has made a general statement of statistical theory applicable to all forms of statistical investigation. Since Prof. Meitzen is of the opinion

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that the essence of statistical science is its method, it will readily be seen that such a general statement is not beyond the range of possibility.

The treatise of Prof. Meitzen is of rather an abstract character, and illustrations do not figure prominently upon his pages. It seems to have been his effort to state his general views in the most condensed form, and to leave the application of them to the reader. It is the object of the present discussion to consider the subject of price statistics in the light of Prof. Meitzen's theory. The effort will be made to show how according to the theory price statistics would be collected, and how the practice accords or disagrees with theoretical percepts. We shall then examine whether the rules drawn from the theoretical consideration of statistical methods will be of service in the use of price statistics.

Statistics is the investigation of aggregates by the enumeration of their component elements, and the comparison of the results. These two steps are clearly marked out. Through the enumeration of the elements we arrive at a knowledge of the aggregate in question. We ascertain that it contains a certain number of units of a given description. The larger the number of units enumerated in the same aggregate the more accurate is our knowledge of it. The groundwork of all statistical effort is such enumeration, and the theoretical rules which apply to unit and aggregate, which must be observed to maintain the integrity of the result, are of universal validity. But the knowledge of the aggregate is unrelated, and obtains its real significance when we compare it with other aggregates of the same general character. This second step of comparison is of no less importance than the first, and intimately related to it.

In every statistical inquiry there are these two steps,—enumeration and comparison, in some cases clearly defined, in others less obvious. We shall consider in turn with especial reference to prices the principles of enumeration and those of comparison. The principles of enumeration above outlined

are sufficiently familiar in their application. In statistics of population we discover sex, age, education, and a host of other characteristics in their numerical distribution in a given population. By increasing the number of characteristics we increase our knowledge of the object of our investigation, the population of a given region. It is clear that when our enumeration is complete our result stands in the form x males and y females in a population, which is typical of all the results.

While nothing could be clearer than the applicability of these principles to population statistics, it cannot be denied that when other branches of statistical inquiry are considered the force of these propositions is not so obvious. In the whole field of economic statistics their significance is not apparent at first glance. In population statistics the elements of aggregate and unit are sharply outlined. Not so in economic statistics. So distinct seem the problems of these two fields of inquiry that it does not appear probable that one could be of benefit to the other. It is not surprising that, historically, they developed independently. If, however, there is any unity in statistical inquiry, what is true of one field of research must apply equally well to the other. If any general formulation of statistical theory is to be considered valid, it must be quite as fruitful in the one field as in the other. Our present concern is to discover if possible in price statistics the analogy with the processes of enumeration here discussed. In the statistics of prices the form of statement is quite different from that customary in the statistics of population, and it would appear that the elements of aggregate and unit were not present. These statistics deal largely in averages, while in population statistics the average is little used.

To suppose price statistics collected in the same way as population statistics, we may consider the aggregate as the total sales of a given class in a given area and period of time. In this case the unit of enumeration would be a certain quantity of the thing sold. The problem would be to discover the exact quantities, in other words, how many units

were sold at each price which may have occurred during the period. The result would be a statement that, of all the goods sold, such a quantity or proportion was sold at the price x, so many at y, etc. Such a form of price statistics might under certain circumstances be very useful. According to statistical theory it is the normal form, and hence incidentally the test of the forms in common use.

The normal form of price statistics is not found in practice. In all branches of economic statistics its use is rare. Yet it needs but little consideration to convince us that it is the normal form. A striking analogy is furnished in the statistics of wages. It has been common to state wages as average wages, but the serious drawbacks to such a statement have led to the more explicit form of classified wages.* This classified wage statement approaches very closely the normal form, which is the first result of statistical enumeration. A further illustration of the use of the normal form in economic statistics may be seen in the statement of the rates of interest on mortgages brought out in the investigation which is being conducted by the Eleventh Census.† The writer has used the classified form in treating of the capital of corporations.‡ Instances need not be multiplied to show that what statistical theory would call the normal form is quite as applicable to certain economic statistics as to those of population.

Statistical theory requires its application to the statistics of prices, but the great difficulty of the case and the comparative value of results obtained by more summary processes have led to the substitution of the latter in many instances for the exact enumeration. In dealing with prices, the aim of the investigation is to obtain as concise a statement as possible of price at a given time and at a given place. This takes the form of the average. From any detailed statistical statement, as for instance the wages of workingmen, or the

* See Evolution of Wage Statistics by Carroll D. Wright, *Quarterly Journal of Economics*, Vol. VI, p. 151 (January, 1892).

†See A Plea for the Average, George K. Holmes, Vol. II of these Publications, p. 421.

‡ Statistics of Private Corporations, Vol. II of these Publications, p. 50.

ages of the population, we can form an average. Such an average is not theoretically distinct from an average price, but the latter may be of great value and the former comparatively worthless. In other words, the end and aim of all statistical work is to find a concise expression for a group of facts. The facts may be so constituted that the most valuable statement is an average, or they may be such that another form of statement is more expressive.*

In the illustration noted above, the age of the population, the deviation on either side of the average is so, great the possible groupings of the facts so numerous, that the average does not give us any very definite information. In a less degree the same applies to wages, and while, therefore, the average may suit certain purposes it does not satisfy the entire range of statistical problems touching wages. As a rule, the reverse is the case in the statistics of prices. Here the general tendency is vastly more important than the deviations from it which in the main are insignificant. The forces which work towards uniformity of price are so much stronger than those which act in the opposite direction that little time need as a rule be spent in the study of the latter. Hence, the aim of price statistics is the average price.

The average age of the population derived from the individual ages of all the members must be a true average. If price statistics should be collected in such a way that we knew the exact quantities sold at each price, we could obtain a true average price. But this is in the rarest cases possible. It is claimed that the price reports of some commercial bodies are constructed on this plan. Where the commerce in any commodity centres in an exchange of any character, it is evident that such process involves but little difficulty. Where this is not the case the difficulty of obtaining exact reports on the amount of sales is so great that it is not attempted.

* Statistical nomenclature is somewhat at sea on the subject of the average. In this paper average means, with Venn, a single artificial value, substituted for a group of actual, concrete values. His use of the term "mean" for arithmetical average seems confusing, and in this paper that idea is expressed by true average. See Venn, On the Nature and Uses of Averages, *Journal of the Royal Statistical Society*, Vol. LIV, Sept., 1891, p. 429.

Theoretical statistics requires the true average. But the true average rests upon an actual enumeration which is almost if not quite impossible. We now enter the field of statistical practice, and here we find various methods of ascertaining average price, which, in theoretical language, are substitutes for enumeration. It becomes our duty to subject these substitutes to the test of theory. This discussion does not purpose to be exhaustive, but to include the more prominent substitutes. The substitutes for the true average which claim our attention are what may be termed the "average of experience," the average of rates, the mean between highest and lowest price, and the representative price.

What I have termed the average of experience is the opinion of persons supposed to be perfectly familiar with the conditions of commerce of the article whose price is quoted. Upon such expert opinion we are forced to rely very largely in the price quotations of trade journals, which form the bulk of recorded prices. Such journals frequently publish prices as highest and lowest, but a single average quotation is not infrequent. How the figure is obtained can, as a rule, only be surmised. It seems probable, however, that the process of obtaining a true average is followed if only in a crude way. The expert knows that large sales have been made at various prices. He will select the price at which sales have been largest, and then consider whether the sales made at other prices have been of importance enough to warrant a deduction from or increase of the most frequent price in making his quotation. In so doing he rounds off his results for convenience sake. The true price average would in many cases be an indefinite number of decimals, but practical considerations hold the expert to certain familiar fractions of cents, or in articles of considerable value of dollars. Quotations of this character, while they do not lay claim to absolute accuracy, still attain in many cases a high degree of precision. They have the confidence of the commercial world, and wide-reaching business enterprises are founded upon them. Scien-

tific statisticians may be disinclined to use figures the accuracy of which cannot be tested, since their origin cannot be traced. But any statistics not founded on actual enumeration are impossible unless confidence be placed in the judgment of those who furnish the original data.

The average of rates is a simple expedient of finding the actual different prices at which the goods in question have been sold, and taking their average irrespective of the quantities sold at each particular rate. Such a process is clear and open, but a question may be raised as to its value. It proceeds on the assumption that the amount of goods sold at each rate is substantially the same. Such an assumption may or may not hit the facts very squarely, but it underlies, as will be seen later, a very considerable part of the work done in the statistics of prices. If the range of variation be not great an average of rates will approach quite closely a true average, and under normal conditions of trade this will be the case.

The mean between highest and lowest price is frequently employed as an average price. It is, perhaps, the least satisfactory of all. If no unusual factors determine the extremes, it is evident that a point midway between the two extremes must come very close to the true average if we can assume a fairly equal distribution of sales at the various intervening rates. As compared with the average of rates this method is inferior, since, besides the assumption of equal distribution of sales which both have in common, this method suffers from the difficulty of an accurate determination of the extremes. While in a concentrated market the difficulty is less, in a diffused commerce it is quite considerable. There are sales which take place under unusual circumstances which are very apt to affect the extremes of price. The question whether these are to be considered commercial sales, and, therefore, the extremes of price, is one that the collector of information must decide, and reliance must be had in his judgment. It should be noted that in the average of rates the inclusion of

these extreme prices will affect the result, though not in so marked a degree as when the result depends upon the extremes only.*

In the three substitutes for the true average thus far considered we deal with an artificial construction in many respects less satisfactory than the true average. But there are some who object to any average, who desire actual concrete facts. It must, however, be evident that we cannot express a group of facts in a single expression which shall be typical of the whole unless it be an average or approach the average in its nature. If we compare a composite photograph which has some analogies to a statistical average with the photographs of the persons who compose it, we will surely find a head which differs less than the others from the type revealed by the composite picture. This head may then be taken as a representative of the type. If there were any means by which this representative could be found without the tedious process here indicated, it would be a great gain. Something parallel to this is done in those statistics of prices which place the representative price in lieu of the average. The laws of trade are so well known that if, instead of pursuing any of the courses here marked, we choose a place where the normal conditions of competition are present, and a normal trade carried on, the specific price in that place or that establishment must approach very closely the average. In this method we secure a result that is purely concrete. It is taken from actual sales. It can be used for statistical purposes because it typifies the true average, and is probably as near an approach to it as can be secured, provided always that insight and judgment have been used in the selection of the establishment. Here again reliance must be placed upon the good faith and the ability of those who collect the figures.

Each of the four substitutes for the true average has its

* An illustration of this form of price statistics is found in the statistics published each year as an appendix to the *Zeitschrift des konigl. preuss. Statistischen Bureau.* They give the prices of certain commodities in 165 markets in Prussia, arranged as highest, lowest, and mean price.

justification. Each abbreviates the statistical method of enumeration. Each requires us to have confidence in the ability and fidelity of those charged with the work. There are practically no price statistics collected by the normal statistical method. It would be an impossibility except in rare cases and restricted areas. In all price statistics we are, therefore, dealing with what Meitzen calls estimates.

The substitutes which we have discussed have their justification in their approach to the average. They can, therefore, be used only when the purpose of the investigation is to ascertain an average price. As has been said, this is the usual aim of inquiries into the statistics of prices, but there are some cases in which the point of interest in prices is not the general tendency, but the deviation from it. The substitutes noted are chiefly of value in the discussion of wholesale prices. They fail utterly when retail prices are to be considered. In retail prices there is a wide variation, and the interest attaches to its extent. This has been the burden of several recent investigations into the course of retail prices. Any method which obliterates the distinctions between them must be faulty. Again, the prices paid in primary markets to the producers of agricultural products vary widely, not only from the market prices of such commodities in the principal distributing centres, but also from each other. In other words, the causes which affect the two classes of prices which we have named are totally distinct from those which govern market prices. An investigation of them must therefore proceed along other lines. No other plan meets the requirements of the case so fully as that of selecting representative establishments or representative primary markets and obtaining the prices in them. But, on the other hand, great care must be exercised in the formation of averages from such data, and it will be observed that the representative establishment plays a very different role in the statistics of prices from the "representative price" which has been discussed.

In the foregoing discussion, both of the true average and

of its various substitutes, no mention has been made of the limits of the inquiry either in time or locality. The discussion is applicable irrespective of these limits, but since it is evident that a price for the whole world, or for a whole century, would be comparatively worthless, attention must be given to these limits.

Let us suppose that the prices had been obtained by any of the methods above described in a given locality. It is evident that in order to cover a larger territory, as a state of a nation, the same methods must be used, theoretically speaking, as in a more restricted district. But to obtain wholesale prices in every locality where the goods were sold, and the volume of the sales, would be a manifest impossibility. We must assume that the prices in these localities are governed by the usual laws of trade, and that the course of prices of those places where the largest volume of sales occurs sufficiently represents the trend of prices for the nation. If a large number of places are selected, and all used in the formation of an average of rates, an equal importance is given to each place, and this may impair the result unless they are approximately equal. Thus in the Prussian figures a very considerable number of small towns in the neighborhood of Berlin are included. In taking an average of rates they may, if all should be higher or lower than Berlin, outweigh the latter in the result. In this respect the figures presented by the Imperial Statistical Office are superior, since they include only the most prominent markets.* In obtaining the wholesale prices, therefore, practical necessity, justified as we have seen by theoretical considerations, compels the statistician to confine his attention to the principal markets. On the other hand, if we consider the two classes of prices already noted as exceptions from the general rule, retail prices and prices paid to farmers, it is evident that to gain an idea of them from a considerable area that a larger number of points must be selected than in wholesale prices. The conditions govern-

*See for illustration *Monats hefte zur Statistik des deutschen Reiches*, Dezember, 1890.

ing retail prices differ in a village from those of a manufacturing town or a large city. The different classes of communities which are represented in the district in question should all be represented in the statistics of retail prices, and of prices paid to farmers. An admirable illustration of the application of these principles is to be found in the investigation of prices both wholesale and retail which is now being carried on by the Senate Committee on Finance. While for wholesale prices the main distributing points in the United States have been selected, for retail prices as many as seventy different points have been chosen, and for prices paid to farmers a still larger number. The details of this work will not be before the public for some months, but the plan has already been described by Mr. Carroll D. Wright in the *North American Review* for December, 1891.

Prices are quoted as daily, monthly, and yearly prices. The latter two may be derived from the former, or may be gathered independently according to any of the methods which have been described. Much depends upon the character of the commodity and of its sale. Staple articles are quoted daily, or else weekly. In ascertaining from the daily or weekly prices the monthly or yearly prices the usual rule is to simply take the average of the prices quoted without regard to the quantities which may have been sold on each day or week.* Such a process is only another application of the average of rates already discussed, and proceeds on the assumption that the volume of sales does not essentially differ from day to day, or from week to week. The difficulties which would surround the effort to estimate the volume of sales have already been alluded to, and prevent obtaining a true average. An exception to this rule is sometimes found in the statistics of prices of manufactured commodities, where

*This method is very generally applied in the trade journals, as in the *Bulletin of the American Iron and Steel Association*, and many others too numerous to mention. It is also applied in the statistics of the German Imperial Office already mentioned. The late Professor Beaujon (*Bulletin de l'Institut International de Statistique*, II, 145) speaks of average monthly prices as the basis of price statistics, and the derivation of average yearly prices from them.

the set price is obtained by dividing the total sales for a given period by the total product. This gives a true average price, but it is valueless for practical purposes unless the product consists of a single article, and is not made in different styles or qualities. These conditions are rarely realized in trade. Another form of price statistics, not unlike those just mentioned, are the average import and export prices of commodities. Statisticians are familiar with those published by the English Board of Trade, the French "Commission permanente des Douanes," and our own Treasury Department. There can be no doubt of such prices being true averages. But the prices so calculated will find a low level if the bulk of the goods are of inferior quality, and a high level if they are of superior grade. One can never know just what such a price represents, since the mixture of high and low grade goods may be infinitely varied. Though they have been frequently used, such statistics of prices seem the poorest that exist, and only of value in default of better. In this discussion of the extension of price statistics in time reference has been had to those articles which figure in the accounts of trade journals, and in like publications. It is unnecessary to dwell upon the fact that in an original investigation yearly prices may be obtained by some other methods. Taking into consideration the general laws of trade, it will be observed that whatever method is pursued, the possibility of variation is only as great as the difference between the highest and lowest prices paid in the year. In order to illustrate the effects of different methods in the calculation of yearly averages, we give a table which presents some calculations on the subject. In separate columns we present the actual prices paid during the year for a certain article, an average obtained by dividing the total of the prices by the number quoted, the mean between the highest and lowest prices, the average of the daily prices, and finally an average of the prices ruling at the beginning of each quarter. An examination of the table confirms what has already been said. When

the range of variation is wide the different methods pursued do not approximate so closely as when the range is small. In the latter case substantial agreement is observed.

TABLE I. COMPARISON OF AVERAGES.

	Price.	Duration of Price.	Average of Daily Prices.	Mean of Highest and Lowest.	Average of Rates.	Average of Prices at Opening of each Quarter.
	Cents.	*Days.*				
1857	137½	56	.....	.....	.....	.....
	140	93	134.246	137.5	137.500	136.975
	135	216	.....	.....	.....	.....
1858	120	365	120.000	120.0	120.000	120.000
1859	127½	90	.....	.....	.....	.....
	130	275	129.384	128.75	128.750	129.375
1860	130	79	.....	.....	.....	.....
	125	95	120.177	125.0	125.000	123.750
	120	182	.....	.....	.....	.....
1861	120	67	.....	.....	.....	.....
	125	235	124.945	125.0	125.000	123.750
	130	63	.....	.....	.....	.....
1862	130	178	.....	.....	.....	.....
	135	24	.....	.....	.....	.....
	140	40	.....	.....	.....	.....
	145	28	145.096	157.5	151.562	137.500
	150	18	.....	.....	.....	.....
	160	31	.....	.....	.....	.....
	167½	14	.....	.....	.....	.....
	185	32	.....	.....	.....	.....
1863	185	30	.....	.....	.....	.....
	200	25	.....	.....	.....	.....
	215	52	.....	.....	.....	.....
	200	115	200.452	200.0	197.500	195.000
	190	63	.....	.....	.....	.....
	200	49	.....	.....	.....	.....
	215	31	.....	.....	.....	.....
1864	215	49	.....	.....	.....	.....
	220	39	.....	.....	.....	.....
	225	17	.....	.....	.....	.....
	235	11	290.274	282.5	257.500	283.750
	250	36	.....	.....	.....	.....
	275	25	.....	.....	.....	.....
	300	12	.....	.....	.....	.....
	350	177	.....	.....	.....	.....
1865	350	88	.....	.....	.....	.....
	250	126	.....	.....	.....	.....
	265	54	.....	.....	.....	.....
	275	97	283.246	300.0	285.000	283.750
1866	275	92	.....	.....	.....	.....
	260	130	266.644	267.5	270.000	267.250
	275	143	.....	.....	.....	.....

We have shown that enumeration in the strict sense required by the theory of statistics is not practicable when prices are the subject of investigation. Resort must be had to various substitutes of greater or less accuracy according to circumstances. The character of these substitutes and some account of their application has been given, and we may now proceed to the second step in statistical inquiry, — comparison.

The comparison of the results of the enumeration is the final step in statistical processes. In the statistics of prices it seems to be the one feature of interest, but we have already demonstrated that an intelligent comparison is not possible without a careful criticism of the character of the information. The most important comparisons in price statistics are those between different localities, different periods of time, and different groups of prices, and they will claim our attention in this order.

The rules of statistical comparisons drawn from the theoretical consideration of the method are very numerous, though they may, perhaps, be summarized in the statement that no comparison is possible unless the analogy of the aggregates is sufficient, and the identity of the units is preserved. To this we should add a third rule in cases where an enumeration has not taken place, and it is that a similarity of the substitutes is necessary. The application of these principles to the usual statistics of population is so obvious that it need not be dwelt upon. It is our purpose to examine how far they throw light upon the comparisons of prices.

Let us consider, first, comparisons between the different localities. With respect to the analogy of the aggregates, it need only be said that this requires the self-evident rule not to compare one class of prices with another. Great care must be taken in making comparisons between localities to preserve intact the identity of the units. This is a matter oftentimes of the utmost difficulty. There are few products of commerce which are exactly the same the world over.

While, in a measure, this is true of certain agricultural products and raw materials of certain manufactures, when manufactured goods are considered, the greatest possible diversity is to be noted. The local comparisons of the prices of such staple articles as grain suffers frequently from a lack of uniform classification in the market quotations of the different commercial bodies.* Comparisons may be made between the prices of pig-iron in England and in the United States, and yet the manufacturer is well aware that a difference exists between the two kinds of pig-iron. Even rudest kinds of manufactured products differ not only from country to country, but from section to section. There is, for instance, no inconsiderable difficulty in comparing the price of cotton goods between Manchester and Fall River. When a higher class of manufactured goods is taken into consideration comparison is almost impossible. The utmost efforts are unavailing to secure any adequate basis for a comparison of the prices of silks as well as any other article which appeals to the fancy and artistic taste of the consumer. This wide diversity in the character of the products must lead to great caution in comparing the prices of articles in different localities even though the commodities be described as the same goods.

The force of what has been said in the preceding paragraph is much greater if we apply it to retail prices. The wide difference in prices which has been noted between articles of the same name, not only in different towns, but in different stores in the same town, forces us to the belief that the articles in question differ from one another in quality.† The taste of persons in different places varies, and this leads to differences in the quality of the goods sold. If this be true

* See the different nomenclature in the Statistics of the German Imperial Office, before noted.

† See on this point, Bayerdörffer, *Einfluss des Detail Handels auf die Preise, Schriften des Vereins für Sozial politik*, Vol. 37, 1888, p. 33. Also Cook, *Study of Retail Prices in Boston and Vicinity*, Vol. II of these Publications, p. 116. Similar experiences in the investigation of retail prices in France are noted by de Foville, *Bulletin du comité des travaux historiques et scientifiques*, Section des sciences economique et sociales, Paris, 1888.

of groceries and household goods in every-day use, it is still more the case in regard to dry goods and other manufactured products. I have in mind an instance from the current investigation of the Senate Committee on Finance, where in the same store two articles corresponding to the description suggested by the committee were quoted at the prices of respectively 13 cents and 60 cents a yard. Experience proves that, however carefully the questions may be framed, it is utterly impossible to describe many articles in such a way that retail dealers throughout the entire country will understand exactly what is meant. In many cases the only adequate description of a manufactured article is too technical for the average merchant not versed in the process of manufacture to comprehend.

In comparing the prices of different localities care must be taken that the prices compared have been obtained according to the same method. Our discussion of substitutes showed that various methods might be employed to give an approximate idea of price, but it must not escape our attention that while the tendency of one method may be to give a result slightly higher than the true average, the tendency of another method may be exactly the reverse, hence the comparison of prices can only be absolutely satisfactory when the methods pursued in the different localities are identical. Cases might arise in which it was desirable to compare the relation of wholesale prices at different points, and ascertain whether the same relation held true in retail prices. In such a case a certain town could be taken as a basis, and the relation of wholesale prices in other towns be calculated. In similar fashion the retail prices could be calculated. The two series would be comparable irrespective of the fact that the wholesale prices might have been collected by one method and the retail by another.

The comparisons between prices at different times are much more numerous and much more fruitful of results than those between different localities. What has been said above with

reference to comparing prices of the same groups applies with equal force here.

The articles whose prices may be compared are subject to change, and it may occur that between the beginning and the end of the period the commodity has so changed its quality that it is not identical throughout.* This, of course, impairs the value of the comparison, but does not render it absolutely worthless, since allowance can be made for such changes in quality oftentimes with little difficulty. This applies to slight changes only. Where the change is great it may make a comparison utterly worthless. Staple articles, especially the raw products of agriculture, are less subject to change than manufactured products. Such improvements in the processes of agriculture as have taken place in recent years affect much more frequently the amount of the product and the economic working of the farms than the quality of the crops. None the less such changes do take place, and in comparing, for instance, the prices of sugar beets at the time when beet sugar was first produced with the price for such product today, an allowance should be made for the greater value of the latter through the increase in the sugar content which the improvement in agricultural methods has gradually brought out. Such instances are, however, rare, and in comparing the prices of this class of commodity we can be certain of a great degree of accuracy.

On the other hand, manufactured products have changed so frequently during the last century through the entirely changed conditions of manufacture that a comparison of prices at different periods seems well nigh impossible. So far as I know no attempt has been made to calculate such prices on a large scale in European countries, and, indeed, Haushofer† roundly declares that it cannot be done. This being the case, it may be well to notice in some detail the methods which have been employed by the Senate Committee

*Compare *Labor Statistics*, Connecticut, 1888, p. 88.

†Compare the recent edition of his *Lehr und Handbuch der Statistik*, chapter on prices.

on Finance in its current investigation. The greatest possible care has been exercised to obtain prices upon exactly the same commodity during a long period of years. The number of different articles in every branch of manufacture is so great, and the changes in quality have been so frequent, that it would be utterly impossible to collect prices of manufactured goods by including all products. On the other hand, in nearly every line of manufacture there is some special article which has remained substantially the same for a long period of years. Through conference with representatives of various manufacturers these articles have been ascertained. They have then been used as representatives of the group of manufactures to which they belong. Care has been exercised that the articles selected should be competitive articles, goods for which there has been in the past a considerable sale, and whose prices have been governed by market conditions. In the course of this investigation certain articles have been found which, while remaining substantially the same, have been subject to few fluctuations in prices. Upon inquiry it has been found that the sale of these articles has been a restricted one, that they did not enter into competition with the other grades of manufacture of the same class. Their price is therefore due to special conditions. It is needless to say that such a price, although preserving the identity of the unit, is not a market price in the sense in which that term is generally used. The great bulk of articles selected, however, are governed in prices by the usual conditions of trade, and it is believed that they will fairly represent the course of manufactured articles. In obtaining wholesale prices in this fashion of certain specific manufactured goods, the identity of the unit is admirably preserved.

In comparing prices of different periods it is found necessary to use information coming from different sources, and in such cases the greatest care must be exercised to ascertain whether the methods of figuring the prices have been identical. None of these methods are perfect, and, while one may

sin in the direction of too high a price, another may sin in the opposite direction. A series of prices for different years, formed partly according to one method and partly according to another, would, therefore, greatly impair the accuracy of the comparison. If, however, we desire to compare two series of prices, it is of comparatively little consequence whether the prices in the one case were obtained in the same fashion as in the other. In such a case it would not do to establish a ratio between the prices of the two series in each year, since such a ratio would probably be incorrect, but we can compare the prices of the two commodities as series. We do not compare their absolute amounts, but their relative variations. The simplest and most effective method of so doing is to take the price of some one year, as 100, and express the other prices of the same series in percentages of this price. The two series reduced to this common form are then absolutely comparable so far as their fluctuations are concerned.

The reason for the rule just stated has been clearly demonstrated in a recent article by Dr. Venn, on the *Nature and Uses of Averages*, in the Journal of the Statistical Society for September, 1891. He there shows that, while for some purposes particular classes of averages must be used, for the mere purpose of comparing groups of phenomena among themselves any form of average which approximately measures the facts will suffice. It must, therefore, be evident that, if from such averages we form a series, we can compare this series with another formed from other averages, even though the latter belong to a different class.

In comparing different groups of prices the analogy required by statistical theory is of a somewhat broader scope. In this case we consciously compare wholesale with retail prices, or farmers' prices with market prices, and the only analogy is in the fact that they are all prices of one class or another.

Comparison between wholesale and retail prices can only be made locally, that is, there must be a relation between the

wholesale and the retail prices. We would not compare the retail prices in Philadelphia with the wholesale prices in Chicago, but we might compare retail prices in Joliet with wholesale prices in Chicago, for it may be assumed that the retailer in Joliet either draws his supplies from Chicago, or that the wholesale prices of the latter place govern the wholesale prices in Joliet. The attempt has been made frequently of recent years to ascertain the amount charged by the retailer in excess of the wholesale price. Not only has this been attempted in cases where the retailer sells directly the goods which he has purchased, but in some few cases where a manufacturing process has taken place, as, for instance, comparing the price of bread with that of flour. The greatest difficulty in such comparison is the preservation of the identity of the unit. Take the simple case of coffee. The retail prices, while nominally for the same article as wholesale prices, differ so widely that the suspicion is awakened that a difference in quality must exist.* It need not be said that this difficulty will be overcome if we could ascertain from the retailer the price which he has paid for the articles. But few merchants are so imbued with the statistical spirit that they are willing to disclose their private affairs to this extent. While we can secure from the retailer the price which he charges his customers, we are obliged to secure the wholesale prices from different sources. Again, in retail trade the possibility of making profit on various kinds of adulteration is so great that it impairs the value of such comparison. The deterioration of goods which have been long in stock is another disturbing element.

Another difficulty in such comparisons arises from the fact that, while wholesale prices are apt to be averages, retail prices are usually collected in the form of concrete actual prices. We do not know whether the average price corresponds in any way with the price paid by the particular retailer, and our investigation must be very broad, even if this is true in the main.

* See Bayerdörffer's investigation, also the French investigation already noted.

If we desire to compare the retail prices of different periods with wholesale prices at the same periods, all the difficulties which we have remarked in comparing different localities apply with still greater force. The information which we can secure is not very accurate. The conditions which prevailed in the retail trade twenty or thirty years ago as compared with those of today are not sufficiently known to enable us to secure accurate data for comparison. If it is difficult to ascertain the relation of the wholesale to the retail prices today, it must be doubly so if our comparison is to be made in a more remote period.

On the other hand, it is not difficult to make a comparison of the course of prices. Just as we can compare the course of prices of two different commodities by reducing them to a series, so we can compare the course of retail prices with the course of wholesale prices of the same commodity by reducing each to a series. In this case, while we may not be sure that the articles compared are exactly the same, we can safely assume that each is representative, one showing the course of wholesale prices, and another the course of retail prices, and these two series may be compared. We can thus ascertain with considerable accuracy whether like tendencies have prevailed in the two branches of commerce, or if there has been a divergence, what has been its character.*

In conclusion, we may briefly restate the limitations upon statistical comparisons which result not only from the difficulty of observing the theoretical rules, but also from the character of the data at our command. For the reasons which we have given, comparisons of prices between different localities can only be made with the greatest caution. The possibility of error is very great. On the other hand, comparisons for different periods for the same article are comparatively easily made, and are fairly accurate. The conditions are such that we must accept local comparisons between different classes of prices only with extreme diffidence, while, on the

* See the tables in Bayerdörffer's study.

other hand, comparisons of this nature between different periods are comparatively accurate. It will be seen that the reduction of price series to common terms is of invaluable aid in all these comparisons.

This examination of the actual condition of price statistics has been carried on in the light of statistical theory as developed by Prof. Meitzen. Such investigations are the real test of statistical theory. If the latter makes clearer the difficulties which practical statisticians have encountered, and which they have endeavored to surmount, we can hope that the application of statistical theory to the various fields of practice will not only explain present difficulties, but help us to avoid obstacles in the future.

MEASURES OF DISTRIBUTION.

By George K. Holmes.

The problem that is the subject of this paper is to find a measure of distribution by which to establish a mathematical comparison of one group of persons with another in respect to the distribution of wealth. The aim is not to determine an individual's place in a group, nor to pay any attention to deviations from the mean. Individuals are to be out of mind, and attention is to be given to the group as a whole in relation to the mass of wealth which is possessed by it, or by a portion of it. The scheme would be inapplicable to an inquiry as to the distribution of black eyes or hereditary traits, but, it is hoped, will answer such a question as this, if statistics of all individual wealth holdings were at hand: "Is wealth more widely, evenly, and generously distributed in Massachusetts than in New York?"

The need of a precise measure of distribution applicable to wealth holdings first led to my study of the matter in 1884, when a scheme was devised that was submitted to the Massachusetts Bureau of Statistics of Labor in 1886. Since then, however, the publication of some of the results of an investigation of the distribution of wealth have been delayed, owing to the necessary priority of publication due to the results of the state census of 1885. The publication of this article, previous to the time when the measure of distribution that it describes may possibly be used by the Massachusetts Bureau, is with the permission of the Hon. Horace G. Wadlin, Chief of the Bureau.

Suppose that in a group of 100 persons — men, women, and children — fifteen persons each own wealth sufficient in amount to be worthy of consideration. One of these persons is worth $2000; two, $3000 each; ten, $5000 each; and two

$8500 each. In another group of 75 persons, nine persons own wealth, one of them being worth $2000; four, $3000 each; three, $4000 each; and one, $5000. As simple as these conditions are the character of the distribution of wealth in one of these groups cannot at a glance be compared with the character of the distribution in the other, and the problem is vastly more complicated to the observer who views large societies of millions of individuals.

The question is not fully answered by saying that in the first group the average holding of each of the 100 persons is $750, and in the second $413 for each of the 75 persons; nor by saying that the average holding for each of the fifteen wealth owners in the first group is $5000, and in the second group of nine wealth owners $3444. To rely solely upon an average would be a glaring misuse of it, since the average may be nearly the same in different groups of persons among whom wealth is very differently distributed. A million dollars may be so distributed among five owners that four of them own $1000 apiece and one of them the remainder: or so distributed that one of them owns $100,000; two, $150,000 apiece; and two, $300,000 apiece. The difference in unevenness of distribution is at once apparent, although the average wealth for each owner is $200,000 in each group.

Nor is it sufficient to say that a certain proportion of the wealth owners own a certain proportion of the wealth, as, for instance, that one-third of the wealth owners in the group first mentioned own 43 per cent of the total wealth, and in the second group 42 per cent; because, as is the fact in these cases, the wealth may be more evenly diffused in the group in which the stated proportion of owners own the larger proportion of the wealth. The character of the comparison that may be made between results obtained in this way may depend upon the fraction of the members of the groups for whose wealth the fractional proportion of the total wealth of the group is ascertained. In some cases the relativity of the fractions of total wealth may be reversed if the adopted frac-

tion of the owners is one-tenth or some other fraction, instead of one-third or some other fraction, while the evenness or inequality of the distribution remains the same in the groups.

Since wealth as well as individuals must be taken into account, the first step is to separate wealth owners from non-owners. There is no distribution among those who do not own wealth; but, at the same time, social condition, so far as it depends upon the ownership of wealth, demands a distinct recognition of that proportion of the people who own none. This is expressed by a percentage. In some selected state 15 per cent of the people may have owned wealth in 1880 and 20 per cent in 1890. This definitely indicates an increase in the width of distribution.

The wealth owners are now set apart for further consideration. The aggregate of wealth may be mostly in the hands of the few or of the many, and it must be known how much wealth each owner possesses. If the same amount is owned by each person, there is equality of distribution; if a few, comparatively, have very large holdings and the many have small holdings, there is great inequality of distribution. It becomes necessary then to represent the number of wealth owners in a table in the common orderly arrangement, together with the amount of wealth possessed by each owner or class of owners. This arrangement is on a progressive scale, with the poorest person, or class, at one extreme, and the richest person, or class, at the other. Upon experimenting with such a tabulation it will be noticed that groups of wealth owners may be represented by five distinct types of arrangement, as shown in Tables I and II on following page.

It is requested that attention may first be confined to the arrangement of the number of owners in Table I. The peculiarities of the five types of groups of wealth owners in regard to their distribution under the progressive scale of classification appear at sight. In Type 1 the numbers are massed among the middle classes with uniform decrease from the middle class toward the extremes. In Type 2 the num-

TABLE I.

Classification of Owners.	Type 1.		Type 2.		Type 3.		Type 4.		Type 5.	
	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.
$1	1	$1	1	$1	15	$15	2	$2	8	$8
2	2	4	2	4	14	28	2	4	7	14
3	3	9	3	9	13	39	2	6	6	18
4	4	16	4	16	12	48	2	8	5	20
5	5	25	5	25	$11\frac{6}{5}$	55	2	10	4	20
6	6	36	6	36	10	60	2	12	3	18
7	7	49	7	49	9	63	2	14	2	14
8	$8\frac{4}{4}$	64	8	64	8	$64\frac{32}{32}$	$2\frac{1}{1}$	16	$1\frac{1\text{-}2}{1\text{-}2}$	8
9	7	$63\frac{52}{11}$	9	81	7	63	2	18	2	18
10	6	60	10	100	6	60	2	20	3	30
11	5	55	$11\frac{5}{6}$	121	5	55	2	$22\frac{10}{12}$	4	44
12	4	48	12	$144\frac{114}{30}$	4	48	2	24	5	60
13	3	39	13	169	3	39	2	26	6	$78\frac{12}{66}$
14	2	28	14	196	2	28	2	28	7	98
15	1	15	15	225	1	15	2	30	8	120

TABLE II. MEASURES OF DISTRIBUTION.

Description.	Type 1.	Type 2.	Type 3.	Type 4.	Type 5.
Median for amount.....	$9.82 $\frac{34}{61}$	$12.79 $\frac{1}{6}$	$8.50	$11.45 $\frac{5}{11}$	$13.15 $\frac{5}{13}$
" " number.....	8.50	11.45 $\frac{5}{11}$	5.54 $\frac{6}{11}$	8.50	8.50
Difference.....	1.32 $\frac{34}{61}$	1.33 $\frac{47}{66}$	2.95 $\frac{5}{11}$	2.95 $\frac{5}{11}$	4.65 $\frac{5}{13}$
Percentage of owners of population.....	23	17	18	15	12
Average holding.....	$8.00	$10.33⅓	$5.66⅔	$8.00	$8.00

bers uniformly increase from the smallest extreme to the largest, and in Type 3 the reverse is true. There is an equal distribution of numbers among the classes of Type 4. Type 5 is the reverse of Type 1, and its numbers uniformly increase from the middle to the extremes. That any existing group

of wealth owners would present so uniform an arrangement as one of these it cannot be supposed, but it must do so with more or less approximation. These uniform arrangements are adopted for bringing out more clearly the principle that follows.

Upon directing attention to the amounts of wealth owned by the classes of owners, it will be noticed that they are not always so uniformly distributed as the numbers of owners are; and, although progressions are apparent, they are stronger for amount of wealth than for number of owners. The reason for this is the multiplication of number of owners into a progressive scale. By adding one person to the class of owners of $12, not $1 but $12 is added to the amount of wealth owned by this class; and by adding one person to the class of owners of $2, only $2 is added to the amount of wealth owned by the same class. Hence it is necessary to take account of wealth as well as of the number of its owners in comparing the evenness or inequality of the distribution of their wealth; and, in comparing two or more groups of wealth owners, it follows that to the extent that the greater proportion of the total mass of the wealth of a group of owners is owned by the smaller proportion (not the same proportion) of the total number of owners its distribution is the more unequal; and to the extent that the greater proportion of the total mass of wealth is owned by the greater proportion of the owners it is the more evenly distributed. It is now more apparent than before that to say that an arbitrarily selected fraction of the members of a group of wealth owners own a certain fraction of the group's wealth does not meet the requirements of the problem. This method is so commonly employed that it is again referred to.

Again, it follows that to the extent that the greater proportion of the mass of the total number of owners occupy a place in the scale of classification approaching the place in the scale occupied by the greater proportion of the mass of the wealth owned the distribution is the more equal. What

is required, then, is the finding of the places in the scale of classification occupied by the greater proportion of the total number of owners, and of the total amount of the wealth owned by the whole group; or, if the distribution is very uneven, the finding of the places in the scale where a mass of owners from one extreme meets an equal mass of owners from the other extreme, and the same result for the amount of wealth owned. Such, indeed, is practically the requirement, whatever the inequality or evenness of the distribution may be.

This is accomplished by finding the medians for number of owners and amount of wealth, and the measure of the distance between the medians is the measure of the inequality of distribution. If one person be added to the class of persons owning $1, the same amount is added to the amount of wealth owned by this class, and if one person is added to the class of persons possessing $15, $15 is added to the wealth of this class; the median for number of owners is not disturbed thereby, but the median for amount is shifted toward the higher extreme and away from the median for number; the distribution has become more unequal and the measure increased.

Application of this principle has been made to the five types of arrangement presented in Table I. (See Table II.) In Type 1 the median for number is $8.50; that is, the mathematical place of the median in the scale of classification is $8.50, although there is no person possessing this amount. There are 64 persons in this group of owners, and half of these are on each side of the median. This divides the class of eight persons, each of whom owns wealth worth $8, so that half of their number, or 50 per cent, is on each side of the median. The four persons, or 50 per cent, on the poorer side of the median in this class are represented in the scale by a corresponding mathematical place, which is $8 plus, not 50 per cent of $8, but 50 per cent of the class as a unit; that is, the median is at a place in the scale where the actual holding

is $8, with 50 per cent of the class on either side, so that $8.50 represents not only the class where the median is found, but also the place in its class.

In like manner the median for amount of wealth in Type 1 is mathematically placed where 52 63 of the wealth in the class of owners possessing $9 each is on the poorer side of the median and where 11-63 is on the richer side.

The pair of medians for each of the five types will be found in the table of "Measures of Distribution," and also the differences between them; the larger the difference the greater being the inequality of distribution. A comparison of these differences reduces the five types of arrangement to three distinct degrees of inequality of distribution, and suggests a further examination of the five arrangements. It will now be noticed that, while there are five types of arrangement, there are but three distinct degrees of distribution, owing to the fact that, the columns for number and amount both being taken into consideration, Types 1 and 2 are almost alike, and that the same is true of Types 3 and 4. There is a massing of number and amount in very nearly the same region in each of Types 1 and 2. The massing of number in Type 3 and of amount in Type 4 is at one end of the scale, while the median for amount in Type 3 and for number in Type 4 is the same. In Type 5 the massing of the number of wealth owners at the two extremes of the scale necessarily masses the wealth at the richer extreme and makes a distinct degree of distribution, which is the most unequal of all, because the two masses of number of owners balance each other at the middle of the scale, and do not permit their resultant median to approach the greater mass of wealth found at the richer end of the scale in the column for amount.

The smaller the number representing the measure the more even the distribution. Therefore, in a group of wealth owners the more even distribution is found if the middle class is more prominent than the poorer class on one side and the richer class on the other, or if the richer class is more promi-

nent than the middle class and the latter is more prominent than the poorer class. The more unequal distribution is found if the richer and poorer classes are each more prominent than the middle class. An intermediate degree of distribution is found if the poorer class is more prominent than the middle class and that is more prominent than the richer class, or if the three classes have no prominence over one another.

It may be supposed that the wealth owners of Massachusetts do not approximately fall into the arrangement of Type 5, nor of Type 4, nor of Type 2, nor of Type 1; until statistics shall decide, it is probable that they are represented by some variation of Type 3, the degree of this type's distribution not being distinctively even nor uneven.

Having determined the proportions of owners of wealth and non-owners in a social group, and the degree of evenness or unevenness with which wealth is distributed among the owners, we need to determine what the character of the distribution is in still another respect. Two social groups may have substantially the same proportion of wealth owners among whom wealth is distributed with substantially the same evenness, and yet the relationship of the owners to their wealth may be widely different in the two cases. The people of North Dakota and the people of New York would be insufficiently compared with each other in an important particular if we were to stop here. The relationship of the owners, as a mass, to their wealth, as a mass, has not yet been touched. North Dakota is poorer than New York; wealth is more abundant in New York, no matter whether owned by a smaller proportion of the people, nor whether more unequally distributed among its owners than in North Dakota. The general level of distribution is higher in New York than in the other state; there is more wealth in relation to the number of its owners.

It remains for the average to find the general level, or plane, of distribution. By no other course can the relation-

ship of mass to mass be represented comprehensively, nor by one number. The average amount of wealth possessed by each owner does not imply that anyone owns the average, nor that a majority, nor any considerable proportion of the owners individually, own wealth near the average in amount. These conclusions may be confirmed or denied analytically by a classification of owners according to the amount of their holdings. It is now necessary to avoid analysis altogether, and to grasp a generality in which rich and poor are individually lost to sight. Nothing but the average answers this purpose.

Since the preceding tables are purely illustrative, the average holdings and imaginary percentages of owners of population have been added merely to complete the formal statement.

Social groups may now be fully compared with one another in regard to distribution, except so far as analysis may be desired. In comparing two groups the statement may be that in one of them a larger proportion of the people own wealth, and that it is more evenly distributed among its owners on a higher plane of distribution. According to general belief, this would be giving to a community a most desired character in regard to the distribution of wealth. For comparative purposes the three descriptions of distribution become six; the proportion of the wealth owners in the population, and the evenness or inequality of the distribution of their wealth among them may be more or less, and the plane on which the distribution takes place may be higher or lower in one social group than in another, or at one time in the same social group than at another. These six comparative descriptions, always to be used in combinations of the three essentials, admit of eight combinations.

An application of this triple measure of distribution may be made to the ownership of government bonds, statistics of which were published by the United States Census of 1880.[1]

[1] Vol. VII, pp. 498–501.

Massachusetts and Maryland are selected for the following table as representing distinctly different results:—

TABLE III.

NUMBER AND AMOUNT OF FOUR, FOUR AND ONE-HALF, AND FIVE PER CENT REGISTERED GOVERNMENT BONDS OWNED IN MARYLAND AND MASSACHUSETTS IN 1880.

MARYLAND.

Classification of Holdings.	Total.		For Males.		For Females.	
	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.	Number of Owners.	Amount Owned.
$500 and under ...	227	$70,700	111	$33,250	116	$37,450
550 to $1,000....	189	173,800	110	101,050	79	72,750
1,050 to 2,500....	174	309,450	103	186,150	71	123,300
2,550 to 5,000....	122	471,100	82	316,750	40	154,350
5,050 to 10,000.. .	98	797,300	60	503,800	38	293,500
10,050 to 25,000....	63	1,090,400	44	782,800	19	307,600
25,050 to 50,000....	27	1,011,250	17	632,550	10	378,700
Over $50,000.....	20	3,065,600	15	2,883,300	5	726,300
Total.....	920	$6,989,600	542	$4,895,650	378	$2,093,950
MASSACHUSETTS.						
$500 and under ...	7,244	$2,060,350	3,526	$1,029,450	3,718	$1,030,900
550 to $1,000...	3,759	3,317,450	2,002	1,782,750	1,757	1,534,700
1,050 to 2,500....	2,784	4,888,650	1,540	2,725,050	1,244	2,163,600
2,550 to 5,000....	1,592	6,131,200	1,030	3,985,700	562	2,145,500
5,050 to 10,000....	814	6,311,950	553	4,278,600	261	2,033,350
10,050 to 25,000....	444	7,260,850	294	4,880,700	150	2,380,150
25,050 to 50,000....	137	6,026,800	117	4,561,400	20	1,465,400
Over $50,000.....	81	9,141,500	73	8,504,200	8	637,300
Total	16,855	$45,138,750	9,135	$31,747,850	7,720	$13,390,900

After treating these statistics in accordance with the method of measuring distribution described on the preceding pages, it appears that in Maryland 0.10 of 1 per cent of the total population, 0.12 of 1 per cent of the male population, and 0.08 of 1 per cent of the female population owned registered government bonds bearing the rates of interest mentioned in 1880; and that in Massachusetts 0.95 of 1 per cent of the total population, 1.06 per cent of the male population,

TABLE IV.

MEASURES OF DISTRIBUTION OF GOVERNMENT BONDS.

Description.	Total.	For Males.	For Females.
MARYLAND — median for amount	$39,411	$45,719	$28,872
" " " number	1,417	1,754	966
Difference	37,994	43,965	27,906
MASSACHUSETTS — median for amount	$9,890	$16,398	$4,795
" " " number	692	784	586
Difference	9,198	15,614	4,209
MARYLAND — percentage of owners of population	0.10	0.12	0.06
MASSACHUSETTS " " " " "	0.95	1.06	0.83
MARYLAND — average holding	$7,597	$9,033	$5,540
MASSACHUSETTS " "	2,678	3,475	1,735

and 0.83 of 1 per cent of the female population owned bonds. The difference between the medians for total number of owners and amount of holdings in Maryland is $37,994; for males, $43,965; for females, $27,906. The difference for the total in Massachusetts is $9,198; for males, $15,614; for females, $4,209. The average holding in Maryland was $7,597; for males, $9,033; for females, $5,540. In Massachusetts the average holding was $2,678; for males, $3,475; for females, $1,735.

The sexes may now be compared thus: A larger proportion of the male population than of the female population owned bonds in each state; the distribution of the amount of the bonds was more unequal among the male owners in each state than among the female owners; and the general level, or plane, of the distribution in each state was higher among the males than among the females.

In comparing the states it may be said that much larger proportions of both male and female populations owned bonds in Massachusetts than in Maryland; that the distribution was much more even for each sex in Massachusetts than in Mary-

land; and that the plane of the distribution was much higher in Maryland than in Massachusetts for each sex.

It is admitted that the medians are not accurately placed in the preceding table, because the class of bond holders in which each median is placed ($10,050 to $25,000, for instance) may include holdings of too wide a range in amount, and because these holdings may be unequally distributed throughout the class. There may be more holdings of $20,000 than of $13,000, and, if this is so, the apparent place of a median in this class is not the true place. However, these errors are probably more or less of a related character, which diminishes their effect in a comparison of the medians, since in such case the errors must tend to cancel each other; and, besides, the difference between any two medians is probably too great to be accounted for entirely by an error due to the too limited classification employed by the Census Office. An error of this sort is the fault of the tables, of course, and not of the process adopted for measuring the inequality of distribution; the classification could have been made as minute as the holdings allow, and the matter is referred to for the purpose of pointing out the minuteness of the classification required by this process of arriving at the measure.

Extra Census Bulletin No. 18 publishes statistics showing the values of mortgaged farms and homes occupied by owners in 10 counties in Kansas and 10 counties in Ohio, and the distribution of these values may be measured by the scheme herein described. The classification of values is not minute enough to insure positive accuracy in computing the places of the medians, but is sufficiently minute to establish true comparisons among them as indicating relative evenness or inequality of distribution. The comparisons would probably be changed only in degree if the classification were minute enough to permit the location of the medians with precision.

The following comparisons of the distribution of the values of mortgaged farms and homes occupied by owners in the

TABLE V.

DISTRIBUTION OF THE VALUES OF MORTGAGED FARMS AND HOMES OCCUPIED BY OWNERS.

10 Kansas Counties.

Classification of Values.	For Farms.		For Homes.	
	Number of Families.	Value of Farms.	Number of Families.	Value of Homes.
Under $100	.....	.....	2	$150
$100 and under $200	3	$445	13	1,842
200 and under 300	7	1,535	28	6,185
300 and under 400	16	5,120	55	17,320
400 and under 500	28	11,340	86	35,125
500 and under 1,000	252	183,363	577	390,675
1,000 and under 1,500	601	690,606	444	491,925
1,500 and under 2,000	861	1,390,611	305	484,266
2,000 and under 2,500	968	2,001,848	190	405,850
2,500 and under 5,000	3,244	10,819,498	453	1,424,664
5,000 and under 10,000	1,224	7,670,806	158	989,150
10,000 and under 25,000	321	4,224,200	63	869,100
25,000 and over	28	904,800	4	130,000
Total	7,553	$27,904,172	2,387	$5,246,252

10 Ohio Counties.

Under $100	1	$98	9	$520
$100 and under $200	22	3,037	40	5,643
200 and under 300	36	7,904	97	21,989
300 and under 400	73	23,146	133	42,526
400 and under 500	60	24,930	140	58,187
500 and under 1,000	375	259,781	946	654,391
1,000 and under 1,500	439	502,337	910	1,036,736
1,500 and under 2,000	332	540,457	853	1,381,153
2,000 and under 2,500	308	646,366	700	1,454,644
2,500 and under 5,000	968	3,276,351	1,785	5,868,917
5,000 and under 10,000	670	4,371,333	902	5,711,010
10,000 and under 25,000	238	3,177,151	297	3,984,295
25,000 and over	21	799,124	42	1,485,960
Total	3,543	$13,632,015	6,854	$21,705,971

selected counties in these two states may now be made: The mortgaged farms in each state, as compared with the mortgaged homes, are owned by the larger proportion of the total farm families, owning and hiring; and in the Kansas counties by the larger proportion of the farm owning families, but by

TABLE VI.

MEASURES OF DISTRIBUTION OF FARM AND HOME VALUES.

Description.	10 Kansas Counties.		10 Ohio Counties.	
	For Farms.	For Homes.	For Farms.	For Homes.
Median for amount	$4,734	$3,886	$6,752	$5,288
" " number	3,302	1,487	2,824	2,214
Difference	1,432	2,399	3,929	3,074
Percentage of these families of total families reporting	42.98	21.29	12.78	6.62
Percentage of these families of total owning families reporting	64.38	41.19	20.32	21.82
Average value	$3,694	$2,198	$3,848	$3,167

the smaller proportion in the Ohio counties. In the Kansas counties the distribution of the farm values is more even than that of home values, but in the Ohio counties is more uneven. The general level of the distribution is higher for farms in both states.

A comparison of the states for farms discloses the fact that a much larger proportion of the total farm families occupy and own mortgaged farms in the Kansas counties than in the Ohio counties, and a much larger proportion, also, of the total farm owning families; and that the distribution of the values of owned and mortgaged farms among the owners is more even in Kansas than in Ohio, on a somewhat lower plane of distribution.

Families occupying owned and mortgaged homes are a larger proportion both of the total home families and of the total home owning families in Kansas than in Ohio; the distribution of the values of homes that are owned and mortgaged is more even in Kansas, and on a lower plane of distribution than in Ohio.

An application of the scheme to the measurement of the distribution of the salaries paid to the office employes of the Pension Office and of the Census Office is made in the fol-

lowing tables. The number of persons drawing each rate of annual compensation is found in the Register of the Department of the Interior for 1891. The total amount of the compensation of each class is obtained by multiplying the number of persons in the class by the rate. It would be better to have actual salary earnings instead of these estimated earnings based on salary rates; but, as a matter of fact, the estimates are close to the true earnings for one year from the summer of 1890 to the summer of 1891, during which time the number of persons in each class changed but little.

TABLE VII.

DISTRIBUTION OF SALARIES IN THE PENSION OFFICE AND IN THE CENSUS OFFICE.

Classification of Salaries.	Pension Office.		Census Office.	
	Number of Employes.	Amount of Salaries.	Number of Employes.	Amount of Salaries.
$240	13	$3,120	57	$13,680
400	25	10,000	22	8,800
600	....	.....	263	157,800
660	24	15,840	....	.....
720	35	25,200	525	378,000
750	3	2,250	....	.....
840	30	25,200	3	2,520
900	186	167,400	755	679,500
1,000	336	336,000	311	311,000
1,200	458	549,600	158	189,600
1,400	524	733,600	29	40,600
1,600	98	156,800	19	30,400
1,800	126	226,800	9	16,200
1,825	....	.....	1	1,825
2,000	173	346,000	10	20,000
2,190	....	.....	15	32,850
2,250	2	4,500	....	.....
2,500	....	.....	2	5,000
3,000	1	3,000	....	.....
3,600	2	7,200	....	.....
5,000	1	5,000	....	.....
6,000	....	.....	1	6,000
Total.....	2,037	$2,617,510	2,180	$1,893,775

The distribution of salary earnings was more uneven in the Pension Office than in the Census Office, and was remark-

TABLE VIII.

MEASURES OF DISTRIBUTION OF SALARIES.

Description.	Pension Office.	Census Office.
Median for amount	$1,400.24	$900.57
" " number	1,200.80	900.29
Difference	199.44	0.28
Average salary	$1,285	$869

ably even in the latter, the medians for number and amount being found in the same class,— that of employes receiving $900; but the plane of distribution was much lower in the Census Office, the average salary in this office being $869, and the average in the Pension Office being $1,285.

It may not be impossible to obtain the required facts in regard to the ownership of wealth, the distribution of which could be measured by the foregoing scheme. Some sort of accurate measure must be employed if it is ever to be determined satisfactorily whether "the rich are growing richer and the poor poorer," or whether the rich are growing richer faster than the poor are, unless the difference in distribution between two dates is so marked that the tendency may be indicated by means of percentages. The scheme herein outlined is suitable for this purpose, it is believed, and is applicable to the measurement of the distribution of the values of real estate, of wage earnings, of cattle, of the shares of corporations, etc., so that comparisons may be established between dates, and among various social groups, with the finest precision.

The belief prevails that the society containing the larger proportion of middle class wealth owners is the more healthy and promising society, other conditions being the same. It is desired that the great mass of the people shall enjoy a high degree of comfort, if not of luxury also; that wealth shall not only be widely diffused among the members of society,

but generously diffused, so that welfare shall be the possession of the masses. The highest welfare of this character does not require the predominance of the middle class, because it is mathematically demonstrable that, other things being equal, social welfare, to the extent that it is derived from wealth, is greater in proportion as the middle class predominates over the poorer class, and the richer class over the middle class; and that the type of distribution next to be desired is that in which the middle class of wealth owners predominates the more over co-equal poorer and richer classes.

STATISTICS OF SUICIDES IN NEW ENGLAND.

By Davis R. Dewey, Ph.D.

1. Sources and authorities for statistics.

As far as my inquiry has gone, I have never been able to find that there has been a study of the statistics of suicide of the group of New England states covering any considerable period of time. A partial analysis of the returns of Massachusetts has been frequently and intelligently made, notably so in the Registration Report of 1885, prepared under the editorial supervision of Dr. Frank Wells, but no attempt was even then made to compare these returns with those from other American communities. Few, indeed, of the states outside of New England have established a thorough system of registration of vital statistics, and consequently do not furnish data which warrant an extended or profitable analysis. Some of the large cities are an exception to this rule, but in these, if taken alone, the circumstances and conditions are abnormal, and do not afford a basis for a comparative study, except within very narrow limits.

In several of the New England states, on the other hand, the collection and publication of statistics of mortality has been pursued with increasing success for two or more decades, and now, with the exception of Maine, can be drawn upon for material.

Massachusetts entered upon the work of collecting and digesting statistics of births, deaths, and marriages in 1843, doubtless stimulated by the precedent which England had set in the issue of her first Registration Report in 1839. The returns were naturally imperfect; no reports whatever were made by 35 towns having a population of 76,654 (1840), or about 10 per cent of the total population of the state. In the first report, returns for suicides are given for counties,

months, and ages, but sex is omitted. This latter significant element was not included until the Fourth Report, in 1845 Another addition was also made at that time in including the place of birth of the deceased, a question, however, dropped in 1850. From this time on there is little change in the returns of suicide until 1885. In that year a law was enacted requiring returns of all violent deaths to be made to the Secretary of State by officers known as Medical Examiners, as well as through the customary local registration machinery. In this way the returns of suicides, and in fact of all violent deaths, are duplicated, but in making the special examination of the circumstances attending the death the Medical Examiners endeavor to secure additional data which had previously escaped registration. Since 1884, therefore, we are acquainted with the method of suicide.

In connection with the reports made by Medical Examiners an important question arises as to the completeness and accuracy of the returns of suicide given in the ordinary way, through certification by the attending physician to the local authority, and the subsequent transmission of this information to the state officials. It will be observed that the returns of the Medical Examiners are larger than those given in the body of the Registration Reports. This is seen from the following figures: —

	Registration.	Medical Examiners.
1885	176	181
1886	149	157
1887	165	173
1888	164	190
1889	175	199
	829	900

The Medical Examiners thus find about eight per cent more suicides than those detected by the usual methods, which alone have been relied upon during the greater part of the history of registration in this state.

In preparing Table I, showing the total number of suicides, I have followed, somewhat arbitrarily it is to be confessed,

the registration returns, not that they are regarded as more accurate, but because it does not appear to be fair to compare the returns of Medical Examiners with those collected by a different method previous to 1885. If eight per cent is lost now, it is highly probable, considering the long uniform excellence of the administration of health and vital statistics in Massachusetts, that the same percentage was lost in the earlier period. The adoption of the more complete returns for purposes of comparison would give an exaggerated increase for the past few years.

It is also to be observed that, from a statistical point of view, the loss of eight per cent in the returns of suicides is not a serious error for the treatment of most of the topics connected with this subject. It is not probable that the calculations as to sex, time of year in which the suicide was committed, or age will be affected by the escape of this fractional part. Calculations as to the method by which self-destruction was accomplished are undoubtedly affected by a deficiency in the returns, for only those cases in which the act was committed by some secret and non-public method would go undetected and unreported. For Massachusetts, however, there are no returns of method for the state at large, save those given by the Medical Examiners since 1884, and consequently there is no need for concern in the treatment of this particular inquiry.

The first Registration Report of Rhode Island was issued in 1853, when the time of year, age, sex, county, and occupation was reported for the two suicides which came under observation. Connecticut published her first Report in 1848, but the nosological arrangement was not adopted until the second Report. Connecticut has also, until lately, been defective as to certain important inquiries. No distinction whatever is anywhere made for a portion of the period as to sex of suicides, and consequently for all the larger calculations into which sex enters as a factor this state is omitted from consideration. Vermont began the work of registration

in 1857, but the returns for the first few years are manifestly so imperfect that no attempt has been made to include them within the scope of this study. The arrangement of data is practically similar to that of Massachusetts. New Hampshire has been one of the most recent states to fall into line, and though there are returns for some years previous to 1883, it has not been thought advisable to place reliance upon them. Maine as yet has no state system of registration, a lapse from sound administrative policy which, it is hoped, will soon be remedied. The authorities for the present treatment are therefore found in the Registration Reports of Massachusetts, 1850–1889; Connecticut, 1856–1889; Rhode Island, 1856–1889; Vermont, 1866–1889; and New Hampshire, 1883–1889. The total number of suicides recorded in these states for the periods named amounts to about 6500, a number sufficiently large to encourage an analytic treatment.

2. Number of suicides.

Table I, which follows, presents the number of suicides in the several states referred to, and Table II corrects the comparison by taking into account the changes in the populations of the respective states, and gives the rate per million of inhabitants. The chief point of interest in this table is the decline in the number during the period of the Civil War in Massachusetts and Connecticut, and the steady increase in the rate since that period in those two states, while the others do not present the same regularity. The rate was low during the civil war and the years immediately succeeding that period, as might be expected from a study of similar occurrences in Europe. It is perhaps worthy of notice that the panic year of 1873 did not witness any increase in suicide,—in fact, the rate both in that year and the next was generally low in all the states considered.

TABLE I.

NUMBER OF SUICIDES IN THE NEW ENGLAND STATES (MAINE EXCEPTED), WITH AVERAGES OF PERIODS OF FIVE YEARS.

Periods and Years.	Massachusetts.	Connecticut.	Rhode Island.	Vermont.	New Hampshire.
1850	49	....	....	....	....
1851	57	....	....	....	....
1852	76	....	....	....	....
1853	67	....	....	....	....
1854	82	....	....	....	....
1855	91	....	....	....	....
Average, 1851-55	**74.6**	....	....	....	....
1856	101	20	4	....	....
1857	97	28	8	....	....
1858	82	30	13	....	....
1859	83	25	9	....	....
1860	113	31	12	....	....
Average, 1856-60	**95.2**	**26.8**	**9.2**	...	....
1861	92	31	12	....	....
1862	92	28	8	....	....
1863	67	15	13	....	....
1864	65	19	6	....	...
1865	78	17	12	....	....
Average, 1861-65	**78.8**	**22**	**10 2**	....	....
1866	73	39	11	20	....
1867	75	25	15	24	....
1868	88	20	18	27	....
1869	92	29	15	30	....
1870	91	27	27	23	....
Average, 1866-70	**83.8**	**28**	**17.2**	**24.8**	....
1871	122	43	19	30	....
1872	117	36	18	25	....
1873	117	24	8	27	....
1874	115	32	18	16	....
1875	159	51	26	27	....
Average, 1871-75	**126**	**37.2**	**19.8**	**25**	....
1876	119	39	18	31	....
1877	163	52	22	32	....
1878	126	58	21	30	....
1879	161	66	13	27	....
1880	133	48	10	30	....
Average, 1876-80	**140.4**	**52.2**	**16.8**	**30**	....
1881	165	69	23	30	....
1882	162	65	31	25	....
1883	167	60	24	23	31
1884	184	65	22	28	37
1885	176	81	20	38	33
Average, 1881-85	**170.8**	**68**	**24**	**28.8**	....
1886	149	80	17	37	28
1887	165	92	16	25	33
1888	164	95	21	33	31
1889	175	80	....	22	29

TABLE II.

PROPORTION OF SUICIDES PER MILLION OF INHABITANTS.

Year.	Massachusetts.	Connecticut.	Rhode Island.	Vermont.	New Hampshire.
1851	55.8	....	.. .	....	....
1852	72.5	....	...	....	....
1853	62.3	....	....	....	....
1854	74.3	....	....	....	....
1855	80.4	....	....	....	....
Average, **1851-55**	**69.0**	....	....	....	....
1856	87.7	47.4	24.5	....	.. .
1857	82.9	65.0	48.2	....	....
1858	68.6	68.0	77.0	....	....
1859	68.6	55.5	52.6	....	....
1860	91.8	67.3	68.7	....	....
Average, **1856-60**	**79.9**	**60.6**	**54.2**	....	....
1861	74.3	66.3	68.0	....	....
1862	73.8	59.0	44.8	....	....
1863	53.5	31.1	72.0	....	....
1864	51.6	38.8	32.8	....	....
1865	61.5	34.4	64.8	....	....
Average, **1861-65**	**62.9**	**45.9**	**56.5**	...	....
1866	56.0	77.0	57.5	61.4	....
1867	55.9	48.7	76.0	73.6	....
1868	63.8	38.4	88.4	85.5	....
1869	64.9	58.8	71.3	91.1	....
1870	62.4	50.2	124.2	69.5	....
Average, **1866-70**	**60.6**	**54.6**	**83.5**	**76.2**	....
1871	81.6	79.0	84.4	90.6	....
1872	76.3	65.1	77.2	75.5	....
1873	74.4	42.7	33.2	81.5	....
1874	71.3	56.1	72.1	45.3	....
1875	96.3	88.2	100.8	81.5	....
Average, **1871-75**	**80.0**	**66.2**	**73.5**	**74.9**	....
1876	70.9	66.4	68.7	93.6	....
1877	95.7	87.2	82.9	96.5	....
1878	72.8	96.0	78.0	90.3	....
1879	91.6	107.6	47.7	81.3	....
1880	74.5	77.0	36.2	90.3	....
Average, **1876-80**	**81.1**	**86.6**	**62.7**	**90.4**	....
1881	90.9	108.8	81.5	90.3	....
1882	87.8	100.8	108.0	75.3	....
1883	88.9	91.3	81.9	69.2	87.2
1884	96.3	97.1	73.7	84.3	104.2
1885	90.6	118.7	65.7	114.4	92.1
Average, **1881-85**	**90.9**	**103.3**	**82 1**	**86.7**	....
1886	74.5	115.2	54.4	111.4	76.8
1887	80.2	130 1	50.0	75.3	89.7
1888	77.5	132.0	63.9	99.4	83.7
1889	80.4	109.1	....	66.2	77.6

The estimates for population in intercensal years are obtained by applying the customary formula for calculating the geometrical increase of the population : $\sqrt[n]{\frac{p}{p^1}} = r$ in which p denotes the population at a given census and p^1 the population at a previous census, and n the number of the intervening years. It is unfortunate that in most of the American Registration Reports the compilers and editors have been content with the arithmetical rate of increase instead of the geometrical rate in computing intercensal populations. In some instances, where the population is increasing rapidly and the census is not taken oftener than once in ten years, a considerable error is introduced which ought to be avoided.

From Table II it is clearly seen that the suicidal tendency has been steadily increasing in the last twenty years in Massachusetts and Connecticut; that in Vermont there has been a general advance, not however so regular, while in Rhode Island no marked tendency in any one direction can be discerned. Taking New England as a whole, it seems probable from the data presented that suicides have increased from thirty to forty per cent since 1860. In Connecticut the advance in the rate has been very marked in the past ten years, disclosing an amount which it is difficult to parallel in English-speaking countries.

It is not possible, as far as my examination goes, to show that there is any great difference in the rate from a geographical point of view. In the several quinquennial periods since 1850 Massachusetts has held the maximum rate on three occasions; Connecticut on one; Rhode Island on one; and Vermont on one. On the other hand, in the twenty-three separate years considered individually, 1866–1888, Connecticut bears the palm for ten of the years; Rhode Island for seven; and Vermont for six. The fluctuations are much more variable in the three smaller states than in Massachusetts.

3. Sex of suicides.

For the consideration of sex relations there are grouped together 6473 cases, tabulated in Table III. In all of the states under consideration a distinction is made for sex for some portion of the period analyzed. Connecticut and New Hampshire are not so complete in these returns, but the reports of the others are uniform and satisfactory.

The proportions of males of the whole number for the several states are substantially identical,—75.1 and 77.1 being the extremes. The range of fluctuation during the several periods is slight. In Massachusetts the limits are 70.4 and 81.7 per cent, and in Vermont the maximum and the minimum ratio are almost identical with those of Massachusetts. These ratios do not differ materially from those observed in Euro-

TABLE III. DISTRIBUTION OF SUICIDES IN NEW ENGLAND STATES ACCORDING TO SEX.

Periods.	Massachusetts.		Rhode Island.		Vermont.		New Hampshire.		Connecticut.[3]		Total.		Percentage of Males.					Total.
													Mass.	R. I.	Vt.	N. H.	Conn.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.						
1851-55	262	110	....	....	....	....	....	....	....	....	262	110	70.4	....	....	....	....	70.4
1856-60	361	115	....	....	....	....	....	....	....	....	361	115	75.8	....	....	....	....	75.8
1861-65	295	99	....	....	....	....	....	....	....	....	295	99	74.8	....	....	....	....	74.8
1866-70	323	96	65	21	100	24	....	....	....	....	488	141	77.0	75.5	80.6	....	....	77.6
1871-75	498	132	61	28	98	27	....	....	....	....	657	187	79.0	68.5	78.4	....	....	77.8
1876-80	574	128	62	22	111	39	....	....	....	....	747	189	81.7	73.8	73.3	....	....	79.7
1881-85	660	194	95	24	103	41	....	....	....	....	858	259	77.2	79.8	71.5	....	....	76.7
1886-89[1]	500	153	49[2]	5[2]	79	32	93	28	276	70	969	272	76.5	92.5	71.2	76.8	79.7	78.0
Total.	3,473	1,027	332	100	491	163	93	28	579[4]	177[4]	4,978	1,495	77.1	76.8	75.1	76.8	76.6[4]	76.9

[1] For four years only. [2] For three years only, 1886-88.
[3] For 1878-84: males, 303; females, 107. Per cent of males, 73.9. Returns of sex are not given for Connecticut previous to 1878, or for 1885.
[4] Including returns as given in Note 3.

pean countries. In the table prepared by Morselli,* showing the influence of sex on suicide, where 56 percentages are calculated for various periods between 1830 and 1876 for nearly a score of countries, 30 of the male percentages fall between 70 and 80 per cent. Prussia, Belgium, Austria, Italy, and some of the smaller German states have a higher ratio for males, 80 or more. The percentages of the New England states accord more closely with those of Norway, Denmark, France, and England than with those of the central European states. Upon this section it only needs to be added that the balance between males and females in the total population in the several states, with the exception of Massachusetts and Rhode Island, is almost even, and that in these two exceptions the distribution is in favor of the female sex, particularly during the latter portion of the period. A strictly accurate adjustment would, therefore, slightly increase the ratios calculated for males in these states.

4. Suicides according to age.

Tables IV–V present the distribution of suicides according to age, and are based upon 6763 cases. Of these nearly two-thirds belong to Massachusetts. In all the states, except Connecticut, the classification is made for five-year periods by sex up to 20 years of age, and for decennial periods after that year to 80. In Connecticut no distinction is made for sex in the age distribution, and for some unaccountable reason, and obviously by error, some eighteen cases are reported as under ten years of age. Table IV shows the absolute number of suicides in the several age periods; Table V the same facts calculated in percentages for ease of comparison; and Table VI the number of suicides in Massachusetts for each age compared with the total population of similar age. The latter is clearly the most satisfactory treatment of the age element, and I regret that I have not had opportunity to make similar calculations for all the states for

* *Suicide.* American Edition, p. 190.

TABLE IV.

DISTRIBUTION OF SUICIDES ACCORDING TO AGE.

Age Periods.	Massachusetts, 1850-80.			Connecticut, 1878-80.	Rhode Island, 1855-80.			Vermont, 1866-80.			New Hampshire, 1863-80.			Total, Excluding Connecticut.		Grand Total.
	M.	F.	Total.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	
0-10	....	....	....	18	...	....	....	....	....	....	....	....	....	....	....	18
10-15	14	1	15	33	1	....	1	5	....	5	2	....	2	22	1	26[1]
15-20	72	69	141		9	7	16	17	8	25	5	4	9	103	88	221[1]
20-30	545	229	774	122	61	30	91	74	32	106	17	5	22	697	296	1115
30-40	619	217	836	138	55	31	86	72	30	102	21	6	27	767	284	1189
40-50	700	203	903	167	95	26	121	65	24	89	20	5	25	880	258	1305
50-60	701	140	841	180	105	21	126	98	35	133	36	11	47	940	207	1327
60-70	501	125	626	92	62	13	75	86	20	106	38	8	46	687	166	945
70-80	271	46	317	65	27	5	32	54	11	56	21	2	23	373	64	502
Over 80	48	8	56	21	10	....	10	15	4	19	4	5	9	77	17	115
Total.	3471	1038	4509	836	425	133	558	486	164	641	164	46	210	4546	1381	6763

[1] Of Connecticut's 33, 3 are credited to the period 10-15, and 30 to 15-20.

a longer period of time. It is popularly believed that the maximum tendency toward suicide is found in the earlier age periods, and this error is due to the fact that allowance is not made for the much larger population living in those earlier age periods, and the relatively small number of those living in the more advanced portion of life. The last table shows that the maximum tendency for males in Massachusetts falls in the age period 70–80, and weakens gradually as the preceding age periods are followed back in order. This is not only true for the averages of the two successive quinquennial periods of years, but is in the main true for the years taken individually, showing that the aberrations are not great. This maximum tendency is found in seven of the ten years in this age group of 70–80, and the exceptions are discovered in the neighboring groups on either side.

In the female sex there is not the same uniformity, probably because the data are not numerous enough to warrant a satisfactory generalization. During the first quinquennial period, 1876–1880, there is little difference in the three age

TABLE V.

DISTRIBUTION OF SUICIDES ACCORDING TO AGE IN PERCENTAGES.

Age Periods.	Massachusetts, 1860–89.			Connecticut, 1878–89.	Rhode Island, 1855–89.			Vermont, 1866–89.			New Hampshire. 1883–89.			Total, Excluding Connecticut.			Grand Total.
	M.	F.	T.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	
0-10	....	....	....	2.1	....	....	....	....	....	....	....	....	....	....	....	....	.02
10-15	.04	....	.03	3.9	.02	....	.02	1.0	....	.8	1.2	....	.9	.5	....	.3	.03
15-20	2.0	6.6	3.1		2.1	5.2	2.8	3.5	4.9	3.9	3.0	8.7	4.3	2.2	6.3	3.2	3.2
20-30	15.7	*22.0*	17.1	14.6	14.4	22.5	16.3	15.2	19.5	16.5	10.4	10.8	10.5	15.3	*21.4*	16.5	16.5
30-40	17.8	20.9	18.5	16.5	12.9	*23.3*	15.4	14.8	18.3	15.9	12.8	13.0	12.9	16.9	20.5	17.6	17.6
40-50	20.1	19.5	*20.0*	19.9	22.3	19.5	21.7	13.4	14.6	13.9	12.2	10.8	11.9	19.3	18.7	*19.3*	*19.3*
50-60	*20.2*	13.5	18.6	*21.5*	*24.7*	15.4	*22.6*	*20.2*	*21.3*	*20.7*	21.9	*23.9*	*22.4*	*20.6*	14.9	18.1	18.1
60-70	14.4	12.0	13.8	11.0	14.6	9.7	13.4	17.7	12.2	16.5	*23.1*	17.4	21.8	15.1	12.0	13.9	13.9
70-80	7.8	4.4	7.0	7.7	6.3	3.7	5.7	11.1	6.6	8.7	12.8	4.3	10.9	8.2	4.6	7.4	7.4
Over 80	1.3	.8	1.2	2.5	2.3	....	2.0	3.1	2.4	2.9	2.4	10.8	4.3	1.7	1.2	1.7	1.7
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

groups between 30 and 60; in the second period the maximum falls in the group 60–70, and there is a steady decrease as the earlier groups are taken up. A more careful analysis further shows that the apparent irregularities are due to very abnormal rates for certain age groups in particular years, as, for example, in 1876 and 1877 there were no suicides between

60 and 70 years of age, exceptions to the rule found only twice in the whole record of suicides in Massachusetts since 1850. There is one point, however, wherein the two sexes differ in a marked way, and that is in the fact that the tendency to suicide is more evenly distributed all through life in the female than in the male sex. The tendency for males is from four to five times as great in the group 70–80 as in that of 20–30; in the female sex this tendency is not more than three times as great.

TABLE VI.

NUMBER OF SUICIDES IN MASSACHUSETTS, 1876–1885, FOR EACH AGE PERIOD COMPARED WITH THE TOTAL POPULATION OF SIMILAR AGE. RATES PER 1,000,000.

MALES.

	10–20.	20–30.	30–40.	40–50.	50–60.	60–70.	70–80.	Over 80.
1876	25.7	54	121	301	281	**486**	287	243
1877	12.6	173	144	295	400	433	**805**	470
1878	12.5	117	190	128	409	**482**	381	217
1879	5.2	153	129	230	492	516	**579**	208
1880	18.6	106	142	123	294	409	**510**	400
Average, 1876–80	**14.9**	**121**	**145**	**215**	**375**	**465**	**512**	**308**
1881	....	135	164	232	375	404	550	**578**
1882	11.8	113	198	198	283	486	**585**	....
1883	5.8	146	150	267	321	345	**618**	....
1884	11.4	97	161	249	509	404	**700**	350
1885	11.1	134	195	272	285	479	**545**	169
Average, 1881–85	**8.0**	**125**	**174**	**244**	**355**	**424**	**600**	**219**

FEMALES.

1876	6	**64**	23	31	46	0	45	0
1877	6	46	68	**101**	59	0	0	0
1878	0	11	37	19	29	**44**	43	0
1879	0	22	73	77	28	**83**	0	132
1880	6	43	50	28	**94**	63	81	0
Average, 1876–80	**4**	**37**	**50**	**51**	**51**	**38**	**34**	**26**
1881	6	43	50	93	39	**204**	39	0
1882	17	30	63	63	103	99	**117**	0
1883	6	41	48	53	88	**136**	76	113
1884	17	40	34	52	98	**171**	112	0
1885	16	45	**81**	43	60	19	36	0
Average, 1881–85	**12**	**40**	**55**	**61**	**77**	**126**	**76**	**23**

The other states of the New England section agree on the whole with Massachusetts in the maximum tendency in the age period 70–80. Table V shows that New Hampshire presents the only exception for males, and there the maximum is pushed on one decade in life. In females again there is less uniformity, this being particularly marked in Vermont and New Hampshire. If due allowance were made for population in age groups in these states it is probable that the rate would be found to be very high in the latter part of life.

A comparison of the rates per million of total population of similar age, as in Table VI, in Massachusetts with similar calculations made for other countries discloses some interesting results. It is unfortunate that England and Massachusetts do not use the same age grouping so as to make a strictly accurate comparison, but the substance of the differences can be detected from the following table, which gives rates for England and Wales for the period 1861–70: —

Age.	Males.	Females.
10-15	4	3
15-20	28	30
20-25	59	31
25-35	93	35
35-45	163	52
45-55	262	83
55-65	375	86
65-75	357	83
75-85	256	72
85 and over	204	50

In England the maximum rate is between the ages 55 and 65, with little difference between that and the next decade of life. There is the same regular decline in the earlier periods of existence. While the rates are higher in Massachusetts the ratios of increase are substantially the same. The maximum for females in England is also in the age period 55–65, and in this respect there is a greater similarity between the two sexes in England than in Massachusetts. In France the

highest rates for males is found in the age period 70–80, and the same is in the main true of the several countries considered in Table XXIX of the American edition of Morselli's work on suicide.

5. Time of year.

The distribution of suicides according to months is presented in Table VII, and the same data are distributed in proportions of 1000 in Table VIII. The tables are based upon 6788 cases. In the Connecticut Reports sex is not distinguished in the time of year of deaths by suicides, and consequently in several of the summaries, as indicated, this state is not included in the calculations.

TABLE VII.

DISTRIBUTION OF SUICIDES ACCORDING TO MONTHS.

Months.	Massachusetts, 1850-89.		Connecticut, 1878-89.	Rhode Island, 1855-88.		Vermont, 1866-89.		New Hampshire, 1883-89.		Total Males, Excluding Connecticut.	Total Females, Excluding Connecticut.	Grand Total Both Sexes, Including Connecticut.
	M.	F.	Total.	M.	F.	M.	F.	M.	F.			
January....	226	58	56	29	6	34	6	5	5	294	75	425
February...	213	61	46	21	7	27	12	9	5	270	85	401
March.....	306	95	66	32	8	39	14	13	2	390	119	575
April.....	368	110	84	45	17	41	8	21	4	475	139	698
May.....	345	94	81	38	16	55	19	20	4	458	133	672
June.....	334	100	85	42	15	51	9	17	6	444	130	659
July.....	305	113	97	40	14	39	22	19	2	403	151	651
August.....	314	84	77	33	10	44	19	15	4	406	117	600
September.	274	87	55	34	12	38	17	13	3	359	119	533
October	268	82	75	32	7	39	14	14	5	353	108	536
November..	261	86	61	29	10	43	14	12	2	345	112	518
December..	276	75	66	28	10	39	6	16	4	359	95	520
No. of Cases	3490	1045	849	403	132	489	160	174	46	4556	1383	6788

The suicidal mania for males reaches its maximum in April, while for females there are two maxima, July and April. If we combine the two sexes and include Connecticut, April claims the largest number. In the case of men the decline

TABLE VIII.

DISTRIBUTION OF SUICIDES ACCORDING TO MONTHS IN PROPORTION OF 1000.

Months.	Massachusetts.	Connecticut.	Rhode Island.	Vermont.	New Hampshire.	Males, Excluding Connecticut.	Females, Excluding Connecticut.	Grand Total.
January.....	62.8	65.9	65.4	61.6	45.4	64.5	54.2	62.6
February.....	60.4	54.2	52.3	60.1	63.6	59.2	61.4	59.1
March.....	88.4	77.7	74.8	81.6	68.2	85.6	86.0	84.7
April.....	**105.4**	98.9	**115.9**	75.5	**113.6**	**104.2**	100.5	**103.8**
May.....	96.9	95.3	100.9	**114.0**	109.1	100.5	96.1	98.9
June.....	95.7	100.1	106.5	92.4	104.5	97.4	93.9	97.1
July.....	92.1	**114.2**	100.9	93.9	95.4	88.4	**109.2**	95.9
August.....	87.7	90.7	80.4	97.1	86.3	89.1	84.6	88.3
September.....	79.6	64.8	85.9	84.7	72.7	78.8	86.0	78.5
October.....	77.1	88.3	72.9	81.6	86.3	77.4	78.1	78.9
November.....	76.5	71.8	72.9	87.8	63.6	75.7	80.9	76.3
December.....	77.4	77.7	71.0	69.3	90.9	78.8	68.6	76.6

from the April maximum is gradual, there being but a temporary halt in August and December. The minimum is delayed until February, but here the small proportion is undoubtedly due to the fact that this month is lean in days as compared with others. If the distribution could be reduced to a daily computation, it is highly probable that the minimum would be found in the first month of the year. Of the four states, Vermont is the only exception to the seasonal law which appears to hold. In that commonwealth the maximum for males is not touched until May, a month later than in the others. If, however, it be true that the suicidal tendency is intimately associated with temperature, and more particularly with the radical changes which nature displays in the spring of the year, with its revolutions in vegetable life, and in a less degree in animal life, it is natural that the maximum should be delayed in Vermont, where spring is more tardy in its coming. In New Hampshire too it will be observed that there are within one as many suicides of the male sex in May as in April.

For women the number of cases is not sufficiently large in

the smaller states to afford satisfactory generalizations. Vermont and Massachusetts are alike in showing the maximum in July, while April takes the lead in Rhode Island, and June in New Hampshire.

It is a notable difference that the suicidal maximum is found earlier in the year in our New England states than in European countries. According to the abundant material brought together by Morselli, "out of thirty-two periods belonging to seventeen European states, the maximum of suicides fell in June nineteen times; in May eight times; and in July five times only. The minimum in nineteen out of thirty-two times happened in December; seven in January; five in November; and only one in October." To sum up our own conditions in somewhat the same manner, the maximum of suicides in three states fell in April; in one in July; and in another in May. The minimum in all except New Hampshire is found in February, while in this one exception it is found in January.

6. Method of suicide.

The returns for determining the manner or method of suicide are by no means as satisfactory as those which have just been analyzed and tabulated. In Massachusetts there is no material of consequence until 1885, since which date, however, the returns are complete and almost beyond criticism. In New Hampshire and Vermont, the only other two states which pretend to make returns upon this point, the "otherwise" constitutes about one-half in the list of methods assigned. The following table shows the method of suicide in Massachusetts for the five years 1885–89.

Hanging is clearly the favorite method for men, and poison for women. The second choice of each sex is the favorite of the other. Women concentrate their attention practically upon three methods, poison, hanging, and drowning, while men add to their resources, "cutting the throat," and "firearms and other weapons." But few men leap from heights

TABLE IX.

METHODS OF SUICIDE IN MASSACHUSETTS, 1885-89.

	M.	F.	T.	Proportion of Males to 100 Females.	Each Sex in Percentages.	
Fire-arms and other weapons...	214	7	221	306	30.3	3.5
Cutting throats.....	71	8	78	887	10.1	4.1
Railroad.....	6	2	8	300	.8	1.0
Drowning.....	93	43	136	216	13.2	21.9
Hanging.....	154	44	199	350	21.8	22.4
Illuminating and other gases...	4	...	4	....	.6	....
Poisons.....	139	78	217	178	19.7	39.8
Leaps from heights.....	4	7	11	57	.6	3.5
Other.....	20	7	27	....	2.8	3.5
					100	100

as compared with women, and here the ratio is in favor of the latter sex in the proportion of 7 to 4. Among poisons arsenic is relied upon in more than one-half the cases of recent years. During the brief period of 1886–89, for which poisons are subdivided, the classification is as follows: —

TABLE X.

SUICIDE BY POISONS IN MASSACHUSETTS, 1886-89.

	Males.	Females.	Total.	Percentages.		
				Males.	Females.	Total.
Arsenic and its compounds	53	49	102	48	71	57
Opium and its compounds..	30	8	38	27	12	21
Other poisons.....	27	12	39	25	17	22
Total.....	110	69	179	100	100	100

Arsenic would appear to be used as an agency for self-destruction more by women than by men, the latter making employment of opiums and its compounds more frequently.

A reference to the returns of England shows that poison is employed twice as frequently in proportion to the total number in Massachusetts as in the mother country. Hanging, on the other hand, does not have as many votaries.

There are other relationships respecting the phenomenon of suicide upon which the returns of the New England states throw no light. We are defective in not recording the civil state, the occupation (save some unsatisfactory entries for Rhode Island), educational conditions, or nationality. The above tables, however, embrace the elements which are generally regarded as the most important for the study of this mysterious regular phenomenon of life.

SEMI-ANNUAL CENSUS OF PAUPERS IN MINNESOTA.

By H. H. Hart,

Secretary of State Board of Corrections and Charities, St. Paul.

The results of the semi-annual enumerations of paupers, taken in the state of Minnesota, are less complete and satisfactory than those of the prison population for obvious reasons; but they are sufficiently accurate to be of great value; and it is believed that with improved facilities the officials will be able to attain a close degree of accuracy.

The results of the United States census inquiry as to the number of paupers are confessed to be absolutely valueless, and this result is inevitable in the nature of things. When an enumerator goes from house to house, knocking at the door and inquiring "Are there any paupers living in this house?" it is easy to anticipate the answer. The only reliable source of information with reference to the pauper population is to be found in those who administer public relief. From this source a complete enumeration of single paupers and pauper families can be obtained.

In the state of Minnesota out-door relief is administered in sixty counties by the county commissioners (five in each county), who are ex-officio superintendents of the poor. In about twenty counties paupers are a charge upon the several townships, cities, and villages, and relief is administered by the township supervisors, or by the municipal councils.

The method pursued in our semi-annual enumeration is to send a blank to each one of these, the last of June or December, in the following form: —

June 30, 1891.
December 31, 1891.

To the County Commissioners.

Gentlemen: — We are anxious to obtain an accurate count of all paupers aided *during the past month* for the semi-annual State Pauper Census. Please fill out the following list of paupers for your district and return same without delay, and greatly oblige,

Yours respectfully,

H. H. HART, Secretary.

STATE PAUPER CENSUS.

JUNE, DECEMBER, 1891.

TO THE STATE BOARD OF CORRECTIONS AND CHARITIES.

The following is a list of the paupers aided in the..... commissioner's district of.....County, Minnesota, during the month ending June 30, December 31, 1891.

.....County Commissioner.

P. O. Address.....

N. B.— Include only paupers who received aid during the past month, and pensioners whose quarterly pension covers this month.

Name of pauper or head of family. Number of other members of family. Kind of relief given (cash, house rent, provisions, transportation, boarded out, etc.).

The blanks are accompanied by return postage. This necessitates correspondence with one thousand persons; most of them respond promptly on the last day of the month. To those who do not respond reminders are sent, in some cases two or three times. Failures to respond are usually from sparsely settled districts, where little or no relief has been given. In such cases the number of paupers is estimated by comparison with previous reports. The reports from the more populous counties and villages are usually very complete. When necessary, the entire results from counties are sent to the county auditor for revision and correction. Reports are also received from the almshouses, public hospitals, and private hospitals of the state of all paupers cared for at public expense.

The enumeration is taken in mid-summer and mid-winter, in order to compare the conditions at the extremes of the year. The results are disappointing. It was anticipated that the number of paupers in mid-winter would be greater than those in mid-summer; but, in fact (outside of the cities of St. Paul and Minneapolis), the total number of paupers in June, 1891, was 3865, and the total number in December, 1891, was 3830, showing more paupers in June than in December. In the two cities, however, the results are different, showing 1574 in June and 2451 in December, an increase of nearly 60 per cent.

For convenience of comparison, the results are reduced to ratios, showing the number of inhabitants of the state to each pauper; but in future the ratio will probably be reversed so as to show the number of paupers in the thousand of the population.

The paupers are subdivided into the following classes: those boarded at public expense, those receiving "out-door relief" without board, and those receiving medical relief only.

The weak point of the enumeration is the number of individuals embraced in the families. In many cases the officers disbursing relief do not know the number of members of the families, and the number is therefore largely a matter of guess work. The average number of persons included in each "case" is 2.4. Probably the number of persons to each case should be somewhat larger than this, as in a considerable number of returns the number of members of the families is left blank, where the indications are that some members of the families should be included. This tendency to error is corrected, however, by the tendency to include self-supporting members of families in the pauper enumerations.

It is the intention, if legislation can be obtained, to establish a complete catalogue of paupers in the state, similar to that kept by some of the charity organization societies.

In my judgment, the only way in which a complete enumeration of paupers by the United States census could be obtained would be by correspondence with those who administer public out-door relief. It might be possible to conduct this correspondence in advance of the taking of the United States census. A list of the paupers in each district could then be furnished to the enumerators, who could be required to fill out detailed schedules with reference to these individuals.

A more satisfactory plan would probably be to designate those who administer public relief as special enumerators, and compensate them suitably for making the necessary returns. I believe there would be no serious difficulty in carrying out this plan; and the expense need not be excessive.

REVIEWS AND NOTICES.

A STATISTICAL STUDY OF ILLEGITIMACY.

Illegitimacy, and the Influence of Seasons upon Conduct. Two studies in Demography. By Albert Leffingwell, M.D. With maps and diagrams. London and New York, 1892. Pp. viii, 160.

One of these studies forms "the first treatise in the English language upon the subject of Illegitimacy," while the other deals with the influence of seasons upon suicides, insanity, murder, crimes against chastity, crimes against the person, birth rates, marriage and divorce, and revolutions and insurrections.

There are many loose notions prevalent in regard to illegitimacy, but very little accurate knowledge; accordingly, the author has attempted to gather within a convenient space authentic statistics on the subject, particularly in connection with the British Isles, but also with some reference to other parts of Europe as well. For the United States the sources of information are meagre.

The first striking fact is the remarkably uniform number of illegitimate births from year to year. During the eleven years 1879–89 the largest number in England was 43,155, the smallest 40,627; in Scotland the extremes were 10,727 and 9,643; in Ireland 3,367 and 3,049. In the same length of time, of 1000 children born, in Ireland from 25 to 28 were illegitimate, 46 to 49 in England, 79 to 85 in Scotland. The same uniformity is seen when we examine the statistics of any individual county for a series of years, some counties having a uniformly large percentage, others an equally low one. To select a few illustrations: of the four northern counties of England, Westmoreland and Cumberland average 70 and 76 illegitimate births per 1000, Durham and Northumberland 41 and 54; again, Norfolk 74, its neighbor, Suffolk, 57. In Scotland the northern counties average 77 per 1000, the northeastern 141, the northwestern 64, the east midland 89, the west midland 65, the southeastern 78, the southwestern 68, and the southern 139. In Ireland, Munster furnishes an average of 17 per 1000, Leinster 22, Connaught 7, and Ulster 40.

Such variations in the different subdivisions of the members of the United Kingdom, and, secondly, the persistence of the same, or nearly the same, average rate in those separate parts, give rise to a number of questions; for counties which showed high rates thirty and fifty years ago show, as a rule, high rates today, and those with a low average then have generally a low average now. What, then, is the influence of poverty? of country and town life? of education? of religion? of legislation and restraints to marriage? of heredity?

It does not appear upon investigation that poverty, city life, and ignorance are so responsible for illegitimate births as one is apt to presuppose. In Ireland the poverty-stricken county Mayo shows 5.6 illegitimate births out of every 1000, the prosperous county Down 51.1. This fact, in varying proportions, is seen over and over again in all countries; not, however, that poverty and chastity always go together, but the presence of the one is not so marked by the absence of the other that any relation of cause and effect between the two can be established. The same is true of town and country life; London, Birmingham, and Liverpool are considerably more virtuous, so far as the proportion of illegitimate births is an index, than are North Wales, Westmoreland, Cumberland, and Shropshire. The prevalence or absence of ignorance, too, is no sure guide, as can be seen from comparing the various countries of Europe, and also from a comparison of smaller districts.

Religion, legislation, and heredity, on the other hand, seem to be the most potent factors in determining the percentage of fatherless children. Religious influences certainly affect conduct, but no peculiar virtue can apparently be asserted for any particular creed. Rigid Calvinism does not prevent the Scottish maiden from going astray; Lutheranism is not a sure protection to the Norwegian and Swede; and though the Roman Catholics of Ireland are comparatively chaste, their sisters of Bavaria do not reach the same standard. But in Bavaria, Austria, and some other countries another consideration is involved,— legal hinderances to marriage. Finally, there is the question of hereditary influences and local sentiment as tending to perpetuate an evil once established in a community. It must, moreover, always be borne in mind that the presence or absence of a high rate of illegitimacy cannot be assigned to any one or two causes exclusively, but that many considerations working together have to be taken into account. Furthermore, concealment is ever possible to a

larger or smaller extent, and even the most careful enumerations cannot be entirely without error. Also, the proportion of illegitimate births is not of itself alone a sure indication of the standard of sexual morality prevailing in a neighborhood or state.

The second study of this volume — on the influence of seasons upon conduct — need be merely referred to. The results may be summed up in a few words: the warm months are the most conducive to attempts at suicide, to attacks of insanity, and to the commission of crimes; the cold months are the least so. Dr. Leffingwell enters into a careful examination of the subject, and brings to his aid data gathered from various countries on the different phases of the topic; he concludes "that either by the gradual increase of solar light and solar heat, or else in some other manner quite mysterious at present, the breaking up of winter and the advent of spring and summer seasons, produces upon all animated nature a peculiar state of excitement or exaltation of the nervous system."

CHARLES F. A. CURRIER.

MORTGAGE INDEBTEDNESS IN EUROPE.

The real-estate mortgage indebtedness and the subdivision of land holdings in eight European nations are the subjects of *Reports from Her Majesty's Representatives Abroad on the Position of Peasant Proprietors*, presented to Parliament in February, 1891. These reports are much more satisfactory, statistically, than the reports from the consuls of the United States, in regard to mortgages in foreign countries, published in November and December, 1889.

Some information in regard to real-estate mortgage indebtedness has been gathered in Austria-Hungary, Prussia, the Netherlands, and Sweden; but Her Majesty's representatives have not presented the statistics of mortgages that they obtained in these countries so clearly nor with such explanation as is required to make their meaning and trustworthiness clear. No attempt seems to have been made anywhere to go back of the mortgage records, and it must be supposed that the face of the records considerably exaggerates the true amount of indebtedness. That this is so in Sweden and in Switzerland is expressly stated in the reports.

The report from the minister to Austria-Hungary contains tables showing in one class the mortgage indebtedness on the real estate of peasant proprietors, on factories, and on house holdings outside of villages in nine provinces, with some classification of indebtedness by objects.

It appears that in 1888, 8.66 per cent of the cases of increase of indebtedness were for the security of purchase money; the amount of debt represented by these cases being 15 per cent of the total amount. These would be remarkably small proportions in the United States, where the percentages for purchase money commonly range between 50 and 75 per cent.

In the vague description of increase of indebtedness "by loans contracted," 42.10 per cent of the number of cases of increase and 52.28 per cent of the amount are included for the same year; and other contracts contributed 7 per cent of the number and 13.29 per cent of the amount.

The percentages for charges on the real estate entered on the records previous to the production of the documents proving their full validity constituted 1.18 per cent of the total number of cases of increase, and 0.80 of 1 per cent of the total amount; while to the issue of warrants for the carrying out of execution 31.10 per cent of the cases of increase of indebtedness are due, and 7.23 per cent of the amount. That nearly one-third of the cases of increase of indebtedness on the real estate of peasant proprietors is due to judicial process appears very remarkable in the United States, where this class of real estate indebtedness is insignificant compared with the total incumbrance.

The partition of real estate inheritances among heirs in these provinces was the cause of 9.96 per cent of the number of cases of increase of indebtedness, and of 11.40 per cent of the amount, this class of indebtedness being virtually the securing of purchase money. But if we add these to the purchase money class, and call the percentage for number of cases representing purchase money 18.62, and the percentage for amount 26.40, still these percentages are very small compared with those found in the United States.

The report from Austria-Hungary lacks needed comparison with peasant population, and with the value of the mortgaged real estate; but it appears that the returns for "small holdings" of peasants, including holdings, factories, and house holdings not situated in towns in these provinces, show that the indebtedness on these holdings has

increased from 1,369,276,041 florins to 1,942,850,083 florins from 1867 to 1888, or 41.89 per cent, the most marked increase being during the four years 1873–76.

During the last 40 years in Denmark the incumbrance on farms has increased from 25 per cent of the value of the landed properties to more than 50 per cent of their value, this increase being due to fluctuations in real-estate values. A century ago the debt was about 40 per cent of the value of the estates, and during the years 1870–84 it was about 43 per cent of the value. These are rough calculations which the report does not substantiate with statistics.

Mortgages were first the subject of satisfactory inquiry in Prussia in 1882, when it was ascertained that in 52 judicial districts the burden of the large estates amounted to 28 times the net proceeds of the land tax derived from them, and that of the middle-sized estates to 18 times the land tax derived from them. This difference is explained by the statement that, with the exception of entailed estates, the large estates change hands on an average every 13 years, whereas the middle-sized estates seldom change hands.

Since 1886 the government has collected annual statistics of the increase and decrease of mortgage debts with the following results: "In the year 1886–87 the mortgage debts of all the landed estates in Prussia increased by 133,160,000 marks; in 1887–88, by 88,030,000 marks; and in 1888–89 by 121,020,000 marks; that is, 342.210,000 marks in three years, a sum equivalent to from 1 to 1½ per cent of the total value of the landed property. Now, as the middle-class estates amount to about the half, the increase of debt during the last three years, if equally distributed, amounts to about 171,000,000 marks; but, as it is ascertained that the indebtedness of the large estates is to that of the middle-sized ones as 28 to 18, the increase of the debt must be reckoned at about 113,000,000 marks. The increase of these debts must be attributed to the bad harvests of the last years, and to divisions of inheritances. In general, the inquiries have shown that the owners of middle-sized estates are not overburdened with debt, and that their condition in this respect is better than that of the owners of large estates."

The indebtedness of peasant proprietors in the Netherlands increased from 959,948 florins in 1883 to 1,888,872 florins in 1887, and this increase is ascribed to agricultural depression.

The total mortgage debt on the landed property of the country

districts of Sweden amounted to £36,507,064 in 1877, and increased steadily from year to year to £50,797,077 in 1886.

Reports in regard to the subdivision of real estate holdings are much more satisfactory than those in regard to mortgages. The division of estates by inheritance, often under compulsion of law, has been carried to a greater extreme in France and Switzerland, and some other parts of Europe, than in the United States. The statistics covering this topic in these reports are substantially the same as have been reported by the consuls of the United States, and published by the State Department.

GEORGE K. HOLMES.

STATISTICS OF DIVORCE IN FRANCE.

In No. 8 (Dec., 1889) of the Publications, Mr. B. F. Keller, in a review of an article by M. Turquan, entitled *Résultats Statistique de cinq Années de Divorce*, which appeared in *L'Économiste Français* of Oct. 26, 1889, presented some of the results of divorce legislation in France since 1884.

Mr. Kellar criticised some of the conclusions of M. Turquan on the ground that the latter had made use of two sets of returns in the compilation of his tables. One of these sets was taken from the records of the officers of the civil state, and the other from the records of the courts. These two sets of records sometimes vary considerably for the same year, owing to various causes of delay (such as appeals, etc.) in the courts. For this reason the slightest reflection will show that the statistics of the officers of the civil state should be greater than the records of the courts. It was on the disagreement of results obtained by using both sets of records that Mr. Keller based his criticism.

A similar criticism has recently appeared in a French journal under the title of *La Statistique des Divorces et les Jugements de Divorce*, by P. de Loyne. (*La Reforme Sociale*, May 1, 1892.) M. de Loyne severely criticises the nonconformity of the two sets of records, and urges that steps be taken to remedy the evil. He states that we should expect the records of the officers of the civil state to show

more divorces than the court records. This, however, is not the case in 1884 (see Mr. Keller's table loc. cit., page 472), when both sets of records were the same. Nor in 1885, when the records in the first case gave 4277 divorces, whereas the court records gave only 4123. For the two years (1884 and 1885) there would be a difference between the two sets of records of 154 divorces. If we subtract from this the number of judgments reversed by the courts (32), we have a remainder of 122 divorces more than were allowed by law during those two years. G. N. C.

ANTHROPOMETRY.

The results of Anthropometry as derived from the measurements of the Students of Amherst College. Amherst, 1892. Pp. 7, Tables.

This paper was presented to the American Association for the Advancement of Physical Education at their annual meeting in Philadelphia, April, 1892. It begins with a sketch of the historical development of the idea that physical measurements may afford a basis for the determination of the ideal man, and presents a further treatment of this enquiry with which Dr. Hitchcock is so thoroughly identified.

Since 1860 about three thousand students have been measured by the Department of Physical Education at Amherst College. The results have been carefully tabulated in several different ways, and are given in six tables appended to this report. All measurements are expressed in both metric and common units. The 54 items noted are derived as follows: weight (1), heights (6), girths (23), breadths (10), lengths (4), strengths (8), lung capacity (1), and pilosity (1).

The six compilations given are: (1) *Table of the Average Student*, showing the average of each item for 7988 men measured. (2) *Table of the Student 21 years old*, showing the measurements of 326 men between the ages of twenty-one and twenty-two years. (3) *Table of the Student of Mean Proportions*, showing the arithmetical mean of the measurements of 2086 men. (4) *Table of 50 per cent Measurements*, showing the items for 2230 men arranged by Galton's Percentile Method. (5) *Table of Ages*, showing the measurements of 1430 men between the ages of sixteen and twenty-six, arranged in ten groups. (6) *Table of Heights*, in which the measurements of 1322

men are grouped under the differing body heights from the lowest to the highest, with the variation of one centimeter, or about half an inch in each group.

After indicating that each of the features emphasized in the tables is of great importance, he says: "But for educational and developmental study where so much of the need of physical training now lies, for the training, strengthening, and developing of weak and poorly developed bodies, the *standard of stature* seems the safest and surest to work from." R. W.

A UNIVERSITY COURSE IN STATISTICS.

In the Programme of Courses in Political Economy announced for 1892–93, by the University of Chicago, it is stated that a course in statistics will be given by Mr. Fisher. The scope of the instruction is indicated by the following paragraphs: —

The purpose of this course is to train students in the theory and methods of statistics. Inasmuch as economic principles throw light upon the proper choice and comparison of statistical data, a knowledge of the Course in Political Economy is a prerequisite to entrance into this course. On the other hand, statistical methods are needed for the correction and furthering of our knowledge of economic principles.

Attention will be given to the vast statistical material at hand, and the student will have an introduction into the bibliography of the subject. The growth of the study, establishment of statistical offices and their organization, collection and elaboration of data, detection and elimination of errors, presentation of results in tabular form, training in graphic representation, will form a part of the work.

Practical exercises will be required of each student in connection with the collection and presentation of statistics of mortality, insurance, production, population, wages, prices, trade, crime, etc. The great libraries of the city of Chicago will furnish exceptional advantages for this work.

CONVENTION OF COMMISSIONERS OF BUREAUS OF LABOR STATISTICS.

The Ninth Annual Convention of the National Association of Chiefs and Commissioners of Bureaus of Statistics of Labor was held at the Windsor Hotel, Denver, Colorado, beginning Tuesday, May 24, President Carroll D. Wright, of the United States Department of Labor, in the chair. An address of welcome in behalf of the State of Colorado was delivered by Governor Routt, and Mayor Platt Rogers welcomed the delegates in behalf of the city of Denver. Andrew Chalmers, Esq., also spoke in behalf of the Trades and Labor Assemblies of Denver. The roll of the States was then called, the responses showing sixteen Bureaus represented by twenty delegates, fifteen of whom were Commissioners or Chiefs, and five Secretaries or Chief Clerks.

On Wednesday, the twenty-fifth, the Convention listened to reports of current work from the different State bureaus represented in the Convention. A condensed summary follows: —

Massachusetts. Horace G. Wadlin, *Chief.* The Bureau is at present engaged in a comprehensive investigation respecting the population residing in rented tenements in the city of Boston. This will cover the number of families residing in hired tenements throughout the city, without restriction as to class; number of persons per room; full information as to rents and sanitary condition (including details as to ventilation, yard room, water-closets, etc.), derived from a house to house canvass of the city conducted by special agents of the Bureau. The investigation will also disclose the occupations and nativities of the population, and other special data. The results of the investigation will be of value in the consideration of the tenement house problem, and will accurately portray the concentration of population in certain quarters of the city, the effect of immigration upon the growth of the city, and will throw much light upon the social condition of the tenement house population of a great city. As the investigation is exhaustive, the best and worst conditions will be shown. The reports will be accompanied by maps.

Pennsylvania. Albert S. Bolles, *Chief.* The current work of the Department covers three topics: 1. Employers' liability for

injuries to their employes. 2. Strikes. 3. Commerce and ship-building on the Delaware from the earliest times to the present. With regard to the first topic the report will present a digest of all judicial decisions on the subject rendered in Pennsylvania from the earliest recorded, about 300 in number, and a résumé of legislation respecting employers' liability in the United States and foreign countries, with a draft of a bill to be presented to the legislature of Pennsylvania. The subject of Strikes will be treated statistically, with full details of the strike among the miners last May, one of the most serious disturbances that has ever taken place in Pennsylvania. The third subject mentioned will embody a historical account of the rise and growth of one of the great industries of the State.

CONNECTICUT. Samuel M. Hotchkiss, *Commissioner.* The forthcoming report will present statistics of manufactures in Connecticut upon the plan followed by the Department for several consecutive years, continued for the purpose of comparison. The report will also contain the results of an exhaustive study of the Fraternal and Mutual Benefit Societies of Connecticut, or doing business there, the object of these societies being to guard their members against the contingencies of accident or death by paying sick or funeral benefits, or life insurance. The investigation of this subject was conducted by mail, supplemented by the work of special agents, using carefully prepared schedules of inquiries. The report will contain full statistical details as to membership, dates of organization, amounts paid for sick benefits, and for insurance, expenses of management, present financial status, etc., and will also present full information as to the different modes of conducting such societies or associations, and as to the general results of their operations for the five years ending with 1891.

MISSOURI. Willard C. Hall, *Commissioner.* The law under which this Department is conducted requires routine annual reports upon certain matters, chief among which is the sanitary condition of factories and workshops. The current report will cover these subjects as usual. Besides this, the Commissioner has carried on an investigation relative to mortgage indebtedness upon farm property in Missouri, to be presented in connection with returns derived from the Eleventh United States Census, and with the census returns covering twelve consecutive years; an investigation relative to the condition of labor organizations in Missouri; and, finally, an inquiry as to the advisa-

bility of establishing free public employment offices, such as exist in Ohio.

INDIANA. William A. Peelle, Jr., *Chief.* This Bureau reports biennially, and is now completing work, reported as in progress at the Convention held last year, relating to wages, hours of labor, co-operative labor, child labor, profit-sharing, and cost of living.

NEW JERSEY. James Bishop, *Chief.* (Report made by Mr. Simmerman, Secretary of the Bureau.) The current report will contain the annual returns as to Condition of Building Associations, required by the statute of New Jersey. The investigations previously made as to the number of years workmen actively continue to follow their trades are to be continued. The Bureau has already reported as to hatters and potters, and will now present data as to printers and the building trades. The results are considered of value in connection with the subject of industrial insurance, inasmuch as they bring out the average duration of employment by workmen in the different industries.

NEW YORK. Charles F. Peck, *Commissioner.* (Report made by Edward J. Kean, Chief Clerk.) The Bureau has completed ten years' work, and is preparing a review and summary of investigations made during that time. It will also present a digest of labor legislation in the State of New York, and will continue its usual statistical abstract of strikes, now presented for several consecutive years.

MICHIGAN. Henry A. Robinson, *Commissioner.* The work now going forward covers the subjects of cost of living, condition of workmen in the building trades in Michigan, and farm indebtedness. The last-named topic will be presented in a manner to allow comparisons as to increase or decrease of mortgage indebtedness, with results determined in a report made by this Bureau in 1887. The current report will also present statistics of wages in Michigan, particularly in Detroit, compiled for a series of years.

CALIFORNIA. George S. Walts, *Commissioner.* The Commissioner gave a detailed account of the difficulties surrounding the collection of statistical data in California, his present work being to overcome some of these difficulties, and to prepare suitable schedules.

COLORADO. Lester Bodine, *Commissioner.* The report will cover the following subjects, all of which are specified in the statute under which the Bureau operates: Mining, silver production, agriculture,

manufacturing, wages, hours of employment, railroad labor, child labor, education of children, labor organizations, sanitary condition of workshops, employers' liability, the Chinese, convict labor, unrestricted immigration, the employment of women and girls, employment agents, the sweating system, strikes, and the unemployed. The subjects of child labor, women wage-workers, and employers' liability will receive special attention.

IOWA. J. R. Sovereign, *Commissioner.* Owing to circumstances explained by the Commissioner, the biennial report of this Bureau, now in progress, is not fully outlined. It will, however, contain a part devoted to the movement of the population from rural towards urban districts in Iowa, with comparisons as to the similar movement in other States. The subject of child and female labor will also be considered, and the question of markets for Iowa products.

KANSAS. Frank H. Betton, *Commissioner.* The report will cover the subject of hours of labor of railroad employes in Kansas. The data have been carefully collected from original sources by the Commissioner, and will be thoroughly analyzed and presented for the entire State. A summary compiled from reports issued by the Bureau for six consecutive years, beginning with 1885, will present average wages per year; average amount of time unemployed per year; and data as to the trend of prices for necessaries of household consumption (groceries, clothing, and also rents) during the same years.

MAINE. S. W. Matthews, *Commissioner.* The current work is devoted to collection of data upon wages and cost of living, particularly of women and child workers in factory employments; also as to the membership of trade organizations in the State.

NEBRASKA. Philip Andres, *Commissioner.* The report will cover the following topics: Mortgage indebtedness; irrigation; profits in agriculture; shipments of surplus farm products of the State; the eight-hour law; and women and child labor. This Commissioner is also factory inspector.

MINNESOTA. L. G. Powers, *Commissioner.* The Commissioner is also factory inspector. The current work relates to inspection, and to the collection of data on the need of more perfect factory legislation. An investigation is also in progress as to the commercial and economic benefits derived from trades unions. The investigation begun sometime ago as to the effect of the improvements in milling upon wheat prices will be continued.

During the sessions of the Convention a general discussion took place as to methods of work and the best means of advancing the interests of statistical investigation. Thursday the annual election of officers occurred, resulting as follows, President Wright declining re-election: President, Charles F. Peck, New York; Vice-Presidents, Lester Bodine of Colorado, and S. W. Matthews of Maine; Secretary, Frank W. Betton of Kansas; Executive Committee, Messrs. Wadlin of Massachusetts, Hotchkiss of Connecticut, Peelle of Indiana, and the President ex-officio. The next Annual Convention will be held at Albany, New York. H. G. W.

STATISTICS OF PRISONERS, 1890.

Statistics of Prisoners, 1890. Collected by the Wardens' Association of the United States and Canada; with an introduction by Roland P. Falkner, Ph.D., Associate Professor of Statistics, University of Penn. Published by the Association, 1892. 800. Pp. 56.

The Wardens' Association of the United States and Canada, as explained by its secretary in the preface to this pamphlet, undertook the collection of these statistics at the suggestion of Dr. Falkner. The tabulation was carried on under the supervision of the secretary, according to plans matured in conference with Dr. Falkner, and the latter has written the entire text of the report. The scope of the inquiry was limited. Returns were received from thirty-eight institutions in the United States, giving record of 9859 prisoners admitted during the year. This is thought to be considerably more than half the entire number of prisoners received at all the prisons of the country during 1890. The information obtained is therefore not only valuable by virtue of the care with which the facts were gathered, but also because of its amount.

In tabulating the facts gathered an effort was made to exhaust the useful permutations through which they could be put. Then, in the twenty-five pages of text, the writer confines himself rigidly to an exposition of what the nineteen tables show. In other words, the attempt was made to formulate all the conclusions which could be reached by purely statistical methods after an investigation of this kind and no others. Many inviting opportunities to base sweeping

conclusions on insufficient data are pointed out only for the purpose of calling attention to the insufficiency of the data.

Particular attention may be called to the portions relating to race, nativity, and parentage, both as an illustration of the care with which the work is done, as well as of the importance of some of the conclusions.

A. G. WARNER.

A CORRECTION.

In his review* of the Report of the Special Committee on Out-Door Alms of the Town of Hartford, 1891, Dr. Warner calls attention to the fact that the per capita cost of poor relief for European countries does not follow from the figures presented by the committee, but is caused by an arithmetical error. Dr. Warner informs us that in a subsequent issue of the Report this has been corrected. The error was two-fold, the figures for cost of poor relief in England and Wales should have been $42,204,105 instead of $101,012,325. Making this correction and dividing by the total population of Great Britain, the figure $1.43 per capita is obtained instead of $1.07. This corrects the statistical table of the committee, and eliminates its manifest inaccuracies. It does not change the contention of the committee that Hartford spends more money than the British Isles, as the per capita expenditure in Hartford is $1.96. This correction is made in justice to the Committee. It does not weaken any material portion of Dr. Warner's criticism.

NET PROFITS OF MANUFACTURING INDUSTRIES IN THE STATE OF MASSACHUSETTS.

I have read with much interest the 21st report of the Bureau of Statistics of Labor of Massachusetts, and also the review of the same in the article by Frederic B. Hawley, in the March *Publications of the American Statistical Association.* It has seemed to me that the net profits of manufacturing for a given time, at least to the shareholders in manufacturing companies, could be arrived at with mathematical accuracy. If, on the 1st of January of any given year, a man bought

* Page 437 of Volume II of these *Publications.*

a given manufacturing stock at the market price, and held it for ten years; received all the dividends, stock or otherwise; paid all the assessments, and at the end of the ten years sold it at the market price, the calculation of the percentage made on the capital that he invested would not be a difficult one. By adding together all the corporations whose statistics are attainable for an equal length of time, it would seem to me to give a fair average of the profits made in manufacturing for that length of time. Improvements or depreciations in plant are elements which enter into the selling price of the various stocks, and the selling price of stocks is a better estimate of their value than any mere appraisal of the property upon which the stocks are based.

Mr. Jos. G. Martin, of Boston, has issued annually a statement of stock fluctuations in Boston bank, insurance, railroad, manufacturing, and other stocks and bonds, together with the dividends paid by each. In his manufacturing lists he has also included the Fall River Manufacturing Companies.

From those lists I have taken every Massachusetts company mentioned in 1882 for which figures are given for ten years. The list follows, and comprises 65 companies in various kinds of business, including the cotton and woollen manufacture, bleacheries, belting, and machinery. Of these 65 companies 41 mentioned immediately below have maintained the same capital during the ten years from 1882 to 1892: —

Appleton.	Lancaster.	Slade.
Boston.	Lowell.	Troy Cotton Mill.
Boston Duck.	Lyman.	Thorndike.
Dwight.	Merrimack.	Crescent.
Hamilton Cotton.	Naumkeag.	Granite Mills.
Lawrence.	Pacific.	Laurel Lake.
Lowell Machine.	Tremont & Suffolk.	Merchants.
Massachusetts.	Chace Mills.	Narragansett.
Middlesex.	Fall River M'f'ry.	Richard Borden.
Otis.	King Philip.	Shove.
Boott.	Mechanics.	Tecumseh.
Boston Belting.	Metacomet.	Union Cotton.
Chicopee.	Pocasset.	Weetamoe Mills.
Flint Mill.	Robeson.	

Five, named below, have stopped during the ten years: —

Annawa Mills.	Montaup.	Sandwich Glass Co.
Fall River Merino.	Quequechan.	

Seven, named below, have had their capital impared and replaced during the ten years: —

Atlantic Mills.	Lowell Bleachery.	Davol Mills.
Everett Mills.	Washington Mills.	Sagamore Mills.
	Hamilton Woollen Mills.	

Twelve, named below, have increased their capital during the ten years: —

Arlington Mills.	American Linen Co.	Barnard M'f'g Co.
Border City M'f'g Co.	Barnaby M'f'g Co.	Conanicut Mills.
Crystal Spring Bleach & Dye Co.	Fall River Bleachery.	Globe Yarn Mills.
	Stafford Mills.	Wampanoag Mills.
Osborn Mills.		

In making my calculations I have divided the companies into two groups: First, the 41 that have gone through the ten years with unchanged capitals; and, second, the 24 that have been unfortunate or put in additional capital during the same time.

I have also made a calculation, by combining these two sets of figures, to show what amount of interest on investment a man would have made who had bought the stock of all these companies on the 1st of January, 1882, and sold them on the 1st of January, 1892, meantime paying in all the money that was paid in, and receiving all the dividends that were declared.

The results for the 41 companies with unchanged capital appear in table on next page.

Summarizing, I find the total dividends $24,420,913 for ten years (which would be an average dividend of $2,442,091.13 per year) to be 6.58 per cent per annum of the par value of the stocks of the above companies. I also find the above annual dividend to be 4.88 per cent of the average selling price for 1882 and 1892, which is $49,993,616. I also find that taking the price at which the stocks could be bought January 1, 1882, which was $55,496,350, and the price at which the stocks could be sold January 1, 1892, which was $44,490,883, that there is a loss in the selling value during the ten years of $11,005,467. Deducting this from the total amount of dividends, $24,420,913, we have left $13,415,446 as the net income for the ten years from 1882

LIST OF COMPANIES WHOSE CAPITAL HAS NOT CHANGED DURING THE TEN YEARS FROM 1882 TO 1892.

	Par Value.	Market Value Jan. 1, 1882.	Market Value Jan. 1, 1892.	Ten Years Dividends.
Appleton	$600,000	$717,000	$345,000	$138,000
Boott	1,200,000	2,580,000	1,620,000	924,000
Boston	800,000	1,060,000	848,000	520,000
Boston Belting	700,000	1,225,000	1,422,750	749,000
Boston Duck	350,000	525,000	562,500	325,500
Chicopee	1,000,000	1,900,000	900,000	600,000
Dwight	1,200,000	1,920,000	1,800,000	1,068,000
Flint Mill	580,000	406,000	609,000	342,200
Hamilton Cotton	1,800,000	2,196,000	1,800,000	648,000
Lancaster	1,200,000	2,700,000	1,866,000	1,020,000
Lawrence	1,500,000	2,700,000	2,250,000	1,365,000
Lowell	2,000,000	2,101,775	1,833,333	803,023
Lowell Machine	900,000	2,277,000	1,305,000	810,000
Lyman	1,470,000	1,719,900	970,200	558,600
Massachusetts	1,800,000	2,520,000	1,890,000	1,026,000
Merrimack	2,500,000	4,600,000	2,625,000	1,600,000
Middlesex	750,000	1,875,000	975,000	765,000
Naumkeag	1,500,000	1,890,000	1,590,000	802,500
Otis	800,000	1,040,000	1,480,000	800,000
Pacific	2,500,000	4,750,000	4,187,500	2,125,000
Tremont & Suffolk	1,200,000	2,103,000	1,464,000	738,000
Thorndike	450,000	495,000	540,000	342,000
Chace Mills	500,000	535,000	500,000	285,000
Crescent Mills	500,000	400,000	175,000	167,500
Fall River M'f'ry	180,000	315,000	216,000	59,400
Granite Mills	400,000	1,310,800	960,000	612,000
King Philip	1,000,000	1,200,000	1,150,000	430,000
Laurel Lake	400,000	376,000	448,000	216,000
Mechanics	750,000	862,500	637,500	397,500
Merchants	800,000	1,000,000	960,000	480,000
Metacomet	288,000	288,000	201,600	44,640
Narragansett	400,000	400,000	388,000	230,000
Pocasset	800,000	480,000	1,088,000	264,000
Richard Borden	800,000	680,000	780,000	368,000
Robeson	260,000	234,000	221,000	105,300
Shove	550,000	577,500	632,500	294,250
Slade	550,000	495,000	330,000	178,750
Tecumseh	500,000	660,000	512,500	322,500
Troy Cotton Mill	300,000	540,000	585,000	300,000
Union Cotton	750,000	1,374,375	1,575,000	1,357,500
Weetamoe	550,000	467,500	247,500	178,750
	$37,078,000	$55,496,350	$44,490,883	$24,420,913

to 1892, which would figure 2.68 per cent as the net income per year. In making these calculations of the selling values I have taken, on the stocks outside of Fall River, the figures for each 1st of January, as shown on Martin's report, while on the Fall River stocks the report for several years shows simply the highest and lowest price of each stock for the year. In valuing these Fall River stocks I have taken for 1882 the lowest prices for the year, and for the selling value in 1892 I have taken the market price January 1st, which allows the leeway in favor of a larger per cent on the total results.

We will next consider the figures of the 24 companies above named whose capital was changed, or whose enterprises were stopped during the ten years: —

Their total par value Jan. 1, 1882, was . . .	$11,800,000
Their total par value Jan. 1, 1892, was . . .	14,875,000
Or an average par value for the time of . .	13,337,500
The amount of dividends paid on these stocks for the ten years was	6,719,250
The amount paid in was	6,135,000
Leaving an excess of dividends over capital paid in of	584,250

for the ten years, or $58,425 per annum, or less than half of 1 per cent on the capital stock, and still less than that on the average selling price.

Ascertaining the loss or difference between the selling price of these companies Jan. 1, 1882, $14,828,375, and the selling price Jan. 1, 1892, $14,111,000, we find it to be $717,375. Deduct from that the margin of dividends above payments, $584,250, and it will appear that these 24 companies lost $133,125, besides interest on their capital, for ten years.

Now, combining the two sets of figures, we find: —

That the 65 companies had an average capital for the ten years of	$50,415,500
That the selling price of stocks Jan. 1, 1882, was	70,324,725
That the selling price Jan. 1, 1892, was . . .	58,601,883
That the total dividends paid amounted to . .	31,140,163
That the amount of cash paid in was	6,135,000

Deducting the cash paid in from the dividends leaves $25,005,163 net cash received by stockholders, or an average of $2,500,516 per annum. This is equal to 4.86 per cent on the capital stock. The

average selling price ascertained as before was $64,463,304. On this sum the average dividend was 3.87 per cent. The loss in value of all the stocks for the ten years was $11,722,842. Deducting this from the dividend leaves $13,282,321, or 2.06 per cent on the average value of the capital invested.

The change in value of the manufacturing stocks may, of course, be said to depend in part upon the years selected. If the selection of one year was during a particularly prosperous time, and the selection of the other year was during a panic, differences would appear which would not be normal. So far as general business is concerned, however, the year 1892 is reckoned as good as the year 1882, and the comparison of those two years would, in that view, seem to be a fair one. Such of these stocks as appear in Martin's Report for 1881 average even higher than they did in 1882, and in 1880 somewhat lower, but not nearly as low as in later years. On the other hand, there was a continuous and large decrease of value in these stocks, amounting to substantially 20 per cent, between 1882 and 1886, and a moderate increase amounting to about 5 per cent on the remaining value since that time.

It is evident from these figures of selling price at different periods that these corporations, as a whole, have been paying out in dividends more money than they have earned during the past ten years, proper depreciation being taken into account.

As the average dividend paid, saying nothing about loss of value, was 3.87 per cent, it looks as though either these great corporations have been particularly unfortunate during the last ten years, or that the figures of the Commissioner are unduly high, and the deductions of Mr. Hawley still more so.

If it be claimed that private concerns make more than corporations, it is, in the first place, a statement difficult of proof; and, in the second place, it would seem to be contradicted by the well-known fact that corporate enterprises are rapidly taking the places of private ones in all large lines of business. I do not care to introduce personal experience in this connection; but that experience in several lines of business — in managing concerns that have always paid their debts — agrees with the above statement,— that manufacturing companies in competitive lines of business cannot expect to pay over 6 per cent on capital, and the usual salaries for supervision. Those having some specialty may do better; those laboring at a disadvantage, either in

location or management or anything else, are pretty sure to do worse. Two matters of argument of Mr. Hawley I will briefly refer to, as they do not seem to me to be sound. The first is, substantially, that since manufacturers pay a given rate for interest, they must make more than that rate. This is not necessarily so; in fact, the contrary is very often true. I am a director in a concern that has declared 5 per cent annual dividends irregularly, and has paid 6 per cent per annum or more for money most of the time. The less prosperous the business the more a party will have to pay for interest, as a rule. Another argument of his in regard to a small business, in connection with a person having a capital of $10,700, seems to me wrongly based. He supposes that that amount of investment and the owner's services will produce $2000 per annum, which I presume would be true, on an average. Instead, however, of dividing that $2000, as he does, into $600 wages, $535 interest, and the balance profit, I should divide it into $535 interest and profit, and the balance wages. Any man who is capable of carrying on business profitably with an investment of $10,000 is also probably capable of commanding a salary $1500 a year if he works for another.

I have no doubt that the net income of all manufacturing concerns is enormously over-estimated by the general public, and that many agrarian and socialistic ideas have as a basis the supposed enormous profits which are made in business. I know of no way so good of arriving at this profit as the course pursued in this paper if continued for a sufficiently long term of years. The general and incidental expenses of business which it is difficult to itemize in advance, but which must be paid just the same, either from principal or profit, form an item of much greater magnitude than most statisticians suppose.

Depreciation is another item that is seldom figured high enough, especially in these days of invention, when the production of a new machine may make the equipment of a factory practically valueless. In this paper I am not attempting to compute the average difference between the wages of supervision and the wages of an operative or mechanic, but the income of any individual from an investment in manufacturing or mechanical enterprises, entirely independent of payment for services.

W. F. Draper.

Hopedale, Mass.

INTERNATIONAL STATISTICAL COMPARISONS.

The following pages are taken from a long paper prepared by Mr. Robert Giffen, C.B., LL.D., and read at the last meeting of the Australasian Association for the Advancement of Science.

I proceed next to statistics from which inferences are commonly drawn as to the qualities of a population,— I mean statistics on such subjects as education, crime, sexual morality, drunkenness, insolvency, and thrift. On all these points different countries have statistics, which may have a meaning when they are properly used, but which it is most difficult to use properly.

To begin with education. Which is the most fortunate population of the world as regards the general education of the people? One often hears of the United States in this connection,— of the numbers of children of school age and the numbers attending school as compared with less fortunate populations. But let me take the following passage from a memorandum by Mr. Fitch, one of Her Majesty's chief inspectors of training colleges, on the working of the Free School system in the United States, France, and Belgium: —

"In England and Wales the calculations of average attendance are made on the assumption that every school is open at least 400 times, or 200 days in the year. It is on this basis that the annual returns in the official report of the Education Department state the average attendance of scholars in infant schools and departments to be 68 per cent, and that in schools for older children to be 82.2 per cent. But in the United States there is no uniform or generally accepted rule respecting the length of the school year. In the principal cities, especially in the East and West, the schools are open 10 months out of 12, and in these the statistics of attendance may be fairly compared with our own. But on taking the country through the average number of days in which the public schools are open is 129 in the year, and this fact implies that in the country places, especially in the South Atlantic and South Central States, the number of school days falls much below that average. In Alabama and in Georgia the schools are open only three months in the year, the teachers are paid by the month, and hold no permanent appointment. In Louisiana and Missouri the small sum appropriated to education by the State barely

suffices to keep the schools at work more than four months in the year. In Nebraska the returns for 5407 schools show 3904 to be kept open for six months and upwards, 529 for more than four but less than six months, and 974 for less than four months.

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It is manifest, therefore, that the figures representing the regularity of attendance require material correction and reduction before they can be properly compared with the statistics of European countries in which schools are, as a rule, kept open during nearly the whole of every year."

The second subject I have named in this connection is crime, and in thinking of it I confess I have had in my mind certain comparisons which have been made in England by visitors returned from Australia to the disadvantage of Australia. There is twice the crime in Australian colonies per head of population, we have been told, that there is in England. A distinction has to be made between mere police and administrative offences, which vary largely according to the things which Legislatures in their wisdom subject to fine or not, and the more serious offences, such as robbery and murder, which are what we think of when we talk of crime. But in hardly any two countries that I know of is the distinction drawn on exactly the same lines. Further, even if the distinctions were much the same, another difference is made by the police. You may have fewer trials and convictions in one country than in another simply because the police for various reasons is less efficient, not because there is less crime.

But admitting that exact comparisons can be made, that statistics of crime in two countries are reduced to common denominators, I should like to point out that the logic of using them as indicative in any way of the general superiority of one population over another may be at fault. So far as can judged, the so-called crime statistics of a country are not necessarily significant very much of the general quality of a population, but they may be significant only of the existence of a criminal element, which is like a disease from which a community suffers, but a disease of a superficial, and not of a vital, character. One population may thus have more crime in it than another, even much more crime, but substantially the two peoples may be almost alike, the extent of the criminality in both being quite immaterial. Say, for instance, that the criminal population by which almost all the crime is done in one country is 1 in 500, or 1-5th of 1 per cent, and

in another population it is 1 in 250, or 2-5ths of 1 per cent, is not the criminal element in either so small as to tell you nothing of the general constitution of the people? Not only, therefore, must criminal statistics be used with care as far as the mere data are concerned, but the difficulty of using them as indicative of the general qualities of a population is overwhelming. They can only be used, if used at all, in conjunction with much other information and statistics.

The statistics bearing on sexual morality are equally difficult to handle. The test here that is most commonly used is that of illegitimacy; but the truth is that illegitimacy by itself tells little, for the simple reason that in a town community there may be prostitution without illegitimate births, whereas in a rural community there may be even less profligacy than in the town, but with a larger number of illegitimate births, in consequence of there being no prostitution. In one country also the births may be registered as legitimate, through the children being born in wedlock; but this may go along with a general laxity of morals of a remarkable kind. Sexual immorality is also like crime itself, even when it can be measured on the same basis in two different communities, more or less a thing apart, and it may or may not be significant of the general *morale* of the population. I suppose it is true, for instance, that the rural population of Ireland stands better, as far as statistics of illegitimacy are concerned, than that of Scotland; but it would be a rash inference that in general *morale* the rural population of Ireland is superior to the Scotch. For certain purposes the statistics are good enough, but they must not be pushed to conclusions they do not bear.

Statistics as to drunkenness also require a good deal of careful handling. In fact, I see no way myself of establishing statistically that one population is more or less drunken than another. Apart from the difficulty already referred to, arising from the different distribution of two populations according to age, so that one population has proportionately more adults than another, and consequently has a larger proportion of convictions for drunkenness and a larger proportionate consumption of alcoholic liquors,— the two tests usually applied in such comparisons,— it has to be considered that the tests themselves are not very good. The convictions for drunkenness, it is plain, like convictions for crime generally, may be very largely a matter of definition and of police administration. Before comparisons can be made the state of legislation and of police administration in

the countries compared must be considered. As regards the consumption of alcoholic liquors again, I have never seen any statistics satisfactorily connecting a relatively large consumption of alcoholic liquors with drunkenness. On the contrary, the consumption in every community is probably at all times much more largely the consumption of sober people than that of people who drink to excess, and you may have much drunkenness among a people who, like the Americans, are generally total abstainers, and little among a people like the populations of the southern states of Europe, who are generally moderate drinkers. Thus the question of drunkenness, or the reverse, in a population is not to be easily treated by statistics.

The statistics of bankruptcy or insolvency again are often quoted as a test of the comparative excellence of commercial communities. Here again I have had in my mind some recent comparisons at home between certain of the Australian colonies and England as regards insolvency. These colonies, we have been told, have twice as many failures per head of population as England, or some such proportion. But the traps in dealing with bankruptcy statistics are innumerable. Even in England it is not easy to compare one period with another, owing to difference of legislation making the conditions and record of official insolvency different at one time from what they are at another. The law at one time makes whitewashing so easy that debtors readily avail themselves of the courts to make themselves officially insolvent, and so you have a large number of bankruptcies in the official statistics. At another time the law is so stringent that debtors evade the courts, while creditors do not make them bankrupt because it is not worth while to do so, and so the official bankruptcies diminish. At one time also non-traders may be made bankrupt, at another time they may not be; and so the record varies. Unless, therefore, the whole basis of the bankruptcy law in each case is studied, no comparison is possible either between period and period in the same country or between different countries. Further difficulties would arise in any comparison owing to the length of the commercial cycle, which renders it most dangerous to take the figures of one year only, or even of two or three years for comparison. We can imagine, then, what wild work is made by amateurs when they compare the insolvency of Australia and England. Apart from these differences there are others which are due to fundamental differences of economic condition. I believe, for instance, that in England a larger proportion of the busi-

ness done is carried on by joint stock companies than is the case in Australia. This may or may not be the case. But, supposing it to be the case, how can the failures of England be compared at all with those of Australia without taking account of the liquidations of joint stock companies, and to how many units of individual failures is that of a joint stock company to be considered equal? I would not go so far as to say that no useful comparison could be drawn from existing data by those who go carefully into the subject and study all the conditions. What I am contending for is that it is utterly impossible for writers in a hurry to make anything of the first figures that come to hand, and assume that the official record of failures in one country at one time means the same thing as the official record of failures in a totally different country at the same or another time.

Here, too, I would also demur to the test of bankruptcy itself as indicative of the general commercial character of a people, even if figures for comparison could be correctly ascertained. More bankruptcy in the one case than in the other may simply mean greater enterprise making more opportunity for failure, and not an excess of dishonesty in the one compared with another. It may also mean that the industries carried on in the one country, and which are suitable to be carried on in it, are essentially more fluctuating at a given period than the different industries of another country. Farming is often the most fluctuating of all industries. A country dependent on farming may suffer more from bankruptcy at a given date than a country less dependent. In turn, a manufacturing or commercial country may suffer more from catastrophies, like war or invasion, than an agricultural country would suffer. Perhaps even these difficulties could be overcome or evaded, and bankruptcy statistics be handled so as to indicate differences of character between two peoples; but the labor of the comparison would be very considerable indeed if anything is to be made of it at all.

I come finally to the last branch of statistics referred to as being often used to compare the character of two people, viz., the statistics of thrift or the diffusion of property among the masses. Here the temptation is to take some one form of saving, such as savings banks, or the holding of land, or investment in government stocks, and roughly judge one people by their habits as to this one form of saving. So far as I have observed, the usual comparisons in detail, even as to the one branch of saving selected for comparison, are most erroneous.

Thus, I have seen the number of separate inscriptions of French *rentes* in the books of the French Ministry of Finance treated as the number of separate holders. The truth is that the question of the number of inscriptions of *rentes*, the inscriptions being anonymous, is purely a formal matter, depending upon the sub-divisions which are most convenient for dealing. One individual may, and as a rule does, hold many inscriptions. When the French issued new loans in 1871 and 1872 to pay the war indemnity to Germany, and in subsequent years to re-equip their army and extend their railways, the number of inscriptions in the books of the Ministry of Finance enormously increased, but it did not follow that the number of separate holders of French *rentes* increased in the same degree, or even increased at all. The same with the holding of land. A broad distinction has to be drawn between the number of separate occupiers and the number of separate occupations, the latter (as in Ireland) being often far more numerous than the former. But, admitting that the figures as to one branch only can be got hold of, it is plain that, unless saving habits in all directions can be compared, no useful comparison can be made at all. What is done by friendly societies, building societies, insurance companies and the like, must all be taken into account, as well as the savings banks, which are most often quoted, or the holdings of the government debt, or the holdings of land, which are the favorite investments of the masses of some countries. But I do not know of any comparison of the kind in which these conditions are complied with. French peasants and working classes are often assumed to be much more saving than the corresponding classes of England, but the statistical proof seems to be wanting, and I am not sure that if the accumulations of English unions, friendly societies, and co-operative societies were properly taken account of, as well as savings banks, holdings of government debt, and investments in land, the English working classes would come so very badly out of the comparison. At any rate, the comparison is more difficult than is often thought.

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I pass on next to a class of statistics which are still more frequently used for international comparison, viz., the statistics of production, industry and trade.

The leading statistics thus used may be classed under the heads of agricultural production, manufacturing production, imports and exports, including shipping, wages, and, finally, accumulated wealth.

The division is not a logical one, but it appears convenient for the present purpose, which is to explain the principal dangers into which the unwary in dealing with the vast branches of statistics included in this department are apt to fall.

As regards agricultural production, then, the initial difficulty of all the statistics is that which we have already had in dealing with population itself,— the different value of the units which go by the same name. The wheat, oats, and barley of one country, though called by the same names, are not the same as the wheat, oats, and barley of another country. There are the very greatest differences in quality, as any price list of London or other market, where grain from every part of the world is sold, would show. Yet nothing is so common as comparisons of the world's production of wheat, for instance, in which this difference of quality is ignored, and fine reasonings are indulged in where this difference of quality might seriously affect the result. What is true of grain is as true, if not more true, of live stock. There are sheep and sheep, cattle and cattle, horses and horses; in truth, the agricultural live stock of any two countries, instead of being susceptible of ready comparison, can hardly be compared directly at all. The point is notoriously of great importance in historical investigations. In comparing England of the present day with the England of previous centuries the difference of the average weight and qualities of the live stock called by the same names has always to be considered. In nothing in recent years, as I understand, have some continental countries, such as France, made more remarkable improvement than in the quality of their live stock, so that with no increase in numbers, or little increase, there has been an enormous advance in real production. But the point is of equal importance in international comparisons. If Australia is to reckon with competitors in wool production, like the Argentine Republic, the average clip per sheep in the respective countries is obviously a necessary coefficient in the calculation, and it becomes of great importance to study in what countries the average is increasing or diminishing, and so on. Officials at the head of the agricultural department in France have been greatly impressed by considerations like these, and have endeavored to substitute a count of cattle by weight for the mere count of heads, but even a correction like this would by no means be sufficient, as there might still be serious differences of quality. The comparisons, then, of agricultural production which one often sees, in which unlike units are taken as

equal without more ado, and reasoned upon as if there were no qualifications, are most misleading. Rectification to any exact degree might not in many comparisons be possible, but the consideration of the point would usually make is possible to turn the figures to support some useful conclusion.

In connection with these comparisons it should also be noticed that many of the deductions per head and per acre, into which it is usual to convert the figures of agricultural production, are calculated to mislead, even when the units themselves are comparable, because the comparisons are with the total acreage and total population of a country, and not with the special acreage and agricultural population. What could be more useless, for instance, than to compare two countries like England and the United States as regards their production of wheat or any other agricultural product per head of the whole population, the one population living on its own wheat and other products, and the other not. All such comparisons to be of any value should be made from the purely agricultural point of view,— to illustrate differences in the style of agriculture carried on, or in the fertility of any two countries. But they are often made with lingering notions that all states can, to some extent, be dealt with as agricultural units, which is far from being the case.

Coming to statistics of manufacturing production, again, and this to some extent applies to agricultural and mining production, what we find is that, save as to some particular industry in detail, and for the purposes of discussions of that industry by itself, there is really no common denominator between countries, except in so far as the production of their respective industries can be represented in money. The coal and iron of one country are not the same as the coal and iron of another; the wool is not the same; the cotton, woollen, and linen manufactures of the one cannot be expressed in the same units of quantity as the similar manufactures of the other; the same with manufactures of metals, leather, and wood, and with machines of all kinds. Even if there is a general likeness in industrial characteristics of any two countries such as England and France, yet the different distribution of the leading industries makes any real comparison between the two, as a rule, impossible, except so far as it can be done in money. To make the comparison in money again presents new difficulties. The value of different kinds of production cannot well be reckoned up.

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Coming next to imports and exports, the point I would urge first is the initial difficulty of a bare comparison of the figures themselves. Imports and exports, instead of giving us easy statistics for many of the purposes for which they are used, are rarely very difficult. I refer especially to the values. Imports are stated in one country at the value of the goods as at the place of shipment; in another as at the place of arrival. In one country the basis of the statement is a declaration of the value by the importer, checked by the customs authorities; in another there is an efficient commission of values, which takes note of market prices, and fixes official prices for everything at more or less frequent intervals. The same with the exports. The denominators are hardly ever the same in any two countries. The result is that there are continual misstatements by amateurs on such questions as a comparison of two countries in respect of the progress of their foreign trade, or in respect of what is called the balance of trade. The falling off of the foreign trade of one country is contrasted with the growth of the foreign trade of another country at the same time, the truth being that in the one case, owing to the system of valuing by merchants' declarations, the volume of the foreign trade expressed in money responds instantly to variations in the market price, while, in the other, owing to the system of official prices fixed at intervals, the volume of trade does not respond at once to variations in market price. In one country, again, what is called an adverse balance of trade appears to be larger in proportion than it is in another country, largely because the imports are valued as at the place of arrival, including freight and other charges to that place; while in the country with which comparison is made the value is taken at the place of shipment, and does not include such additions. In the latter case, therefore, the exports form a total more nearly approximating that of the imports than in the former. All this confusion is due simply to the fact that the units of the imports and exports are not, in fact, the same. The record is not made in the same way.

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Generally, however, I should like to add that the selection of foreign trade, as specially a test of the welfare of nations, does not seem to be in any way justified. Whether the foreign trade of a given country is large or small in proportion to its whole production is an affair to a large extent of size or of historical evolution, and nothing can be

made of comparisons unless attention is given to the point I have already suggested,— that of size and general similarity of conditions. But it is quite conceivable that nations might approximate to each other in many respects, and the one have a large foreign trade and the other not, yet both be in much the same condition of individual prosperity. Accident might determine that the one should be more self-contained than the other, so that its exchanges with other countries should bear a less proportion to its total industry. France and England are very good illustrations of essential differences of this sort, England having much more manufacturing, shipping, and foreign trade than France, but France being certainly a highly prosperous nation, with home industries of different kinds which England either has not at all or not to the same degree, and the products of which are only or largely obtained in England by exporting something else. All these general comparisons between nations in which the foreign trade is spoken of or assumed to be representative of the total trade are therefore very much to be deprecated. Import and export statistics, apart from the special danger of using them, which I have described, cannot be properly used for such comparisons.

I come next to international statistical comparisons in respect to wages, which present some curious difficulties of which most of those who make such comparisons seem totally unaware. In the primary use of records of wages, viz., their use by the laborer or workman, who has no employment, or small wages in one place, and finds he can better himself by going to another, these difficulties do not arise. If the facts recorded are true, the laborer or workman has something on which to act, and he can attend to all the points and qualifications necessary. But when the same records are used, or an attempt is made to use them, for more general purposes, difficulties begin. Length of working day, continuity of employment, and other points must all be recorded when a general statistical account of the wages-earning classes of a people has to be built up. So little have such matters been studied, however, that I doubt the existence of any comparison of wages in different countries which is even formally complete. No country has, as yet, a tolerably complete account of its own wages in which attention is given to all these points; much less is there any possibility of international comparisons.

As the primary records are, however, sometimes used for such comparisons, and we get such statements based on them as that wages are

50 or 100 per cent higher in the United States, say, than in England, special attention may be drawn to the failure of the comparison in point of logic. In the absence of any account of length of the working day and continuity of employment, no proper comparison can be made. This applies specially to a comparison between wages in out-of-door trades in a country like the United States, with a severe climate, and wages in the same trade in England. Wages in the former country may well be higher per nominal day or week of actual work, and yet the difference not be so great when the earnings and hours of labor of the whole year in England are reckoned.

What I would most desire to direct attention to, however, is the statistical importance of a somewhat different point. This is the distribution of the population according to remuneration. It is quite conceivable that in one of two countries the earnings, and still more the nominal wages, may be higher than in the other in every single employment which can be enumerated and compared, and yet the average earnings of the average wages-earning man may be higher in the latter country than the former, the reason being the different distribution of the people according to earnings. This can be shown very clearly in a theoretical comparison. Take first a community of 1000 wages-earners, with the people distributed according to earnings, in the following classes — A, B, C, D, and E — as follows: —

FIRST COMMUNITY.

Class.		Per Annum.	Nos.	Total.
A.	Earnings.....	£50	500	£25,000
B.	"	60	200	12,000
C.	"	70	100	7,000
D.	"	80	100	8,000
E.	"	90	100	9,000
		Total.....	1,000	£61,000

Average per head, £61.

And compare this with another community of equal numbers, in which there are also five grades, each remunerated at a lower rate than the corresponding grade in the first community, but in which the average of the whole is higher because of the different distribution of the people among the grades: —

SECOND COMMUNITY.

Class.		Per Annum.	Nos.	Total.
A.	Earnings	£40	100	£4,000
B.	"	50	100	5,000
C.	"	60	100	6,000
D.	"	70	200	14,000
E.	"	80	500	40,000
		Total.....	1,000	69,000

Average per head, £69.

In a comparison of rates of wages merely according to the nature of the employment, the wages in the first community would obviously appear higher than in the second, and this would be strictly true in a sense; but the inference would be untrue that the average earnings of the wages-earning classes in the first community, striking a true average, would be higher.

The principle of this theoretical comparison I believe helps to explain the actual facts as between an agricultural new country like the United States or Australasia and an old country like England. In the former agricultural wages are higher than in England, and almost every sort of employment, subject, however, to some qualifications, such as length of day and continuity of employment, is better paid than in England; but it is a *non sequitur*, not at first apparent, that the average earnings all around are also higher, the truth being that owing to the larger proportion of artisan classes in England the average earnings of the working classes may be as high or higher in England than in the United States, or at any rate not very far short. The mode of comparing wages in two countries is thus a most critical question. I have been often puzzled myself to explain how it is that we arrive in England at comparatively high figures for the aggregate income of the nation when most of the rates of wages are apparently so much lower — employment for employment — than they are in the United States or Australasia, and to a large extent I believe the solution I have now suggested is the true one. It is not enough, then, to compare employment with employment, but mass must be compared with mass.

Other dangers in these international statistical comparisons, such as differences in the purchasing power of money in different places, may be suggested. But I should not be disposed to lay so much stress on any other point as upon that of the relative importance of different employments in different countries. In these days of cheap freights and rapid transit, the equalization of prices in all countries has been carried very far indeed, the most important differences that remain being, I believe, artificial, arising from the protection of food products in countries like Germany and France, and the like causes. The different distribution of populations according to employments remains, however, an enduring cause of differences in their relative aggregate earnings and average earnings per head.

Finally, I have some remarks to make on the dangers of comparisons between nations as to their aggregate wealth.

Apart from all other difficulties that of the data themselves is here very great. It is hardly possible to obtain an account of the wealth of any country on any basis that can give a minutely accurate result, and it is the more difficult to obtain such accounts for any two nations made up in exactly the same way. If one country, therefore, is made out to have an aggregate wealth of about £250 per head, and another £300 per head, it may well be that, owing to the necessary want of exactness in the calculation itself for any country, and the differences of method employed in each case, the facts represented by these figures may either be much the same, or the country whose wealth is computed at the smaller figure may really be the richer of the two. Before any comparisons can be made at all, then, the methods observed in each case must be carefully followed, and particularly it must be observed whether they are likely to give a rack valuation or not. My own impression is that, except where the differences are enormous by almost any method of calculation, but little can be made of differences between country and country. Figures that are within sight of each other as much as are £250 and £300 per head, provided much the same methods have been followed, are practically much the same thing.

The comparison, also, is of little value unless accompanied by statistics of relative income, statistics of the sources of the wealth or income, and the like information. Accumulated wealth is only one element of economic strength.

A special point of great difficulty is how to deal with the wealth of a community which includes individuals having large investments abroad, and with the wealth of another community which is indebted to persons resident abroad in its public capacity, and whose individual members are also indebted to members of other communities. To a certain extent the foreign investments of a community in the first case are not available resources. Suppose the investments to be made in a foreign country with which it goes to war, the whole resources which are counted part of its wealth would really count on the other side. In the same way a country which has borrowed largely has the whole wealth really available for many purposes without any deduction for what it has borrowed. In war with a community from which it had borrowed this would at once be apparent, but in other contingencies, also, the indebtedness is not a real deduction, the wealth belonging to the foreign non-resident never being really taxable as if

he were resident. I have thought it expedient in my own calculations of the wealth of the United Kingdom to include the foreign investments of the members of the community at home as far as possible, and similarly I would make a deduction in the case of an indebted community equal to the amount of its indebtedness. All this, however, would be on the assumption of a continuation of peace, and subject to the qualifications that in certain circumstances a different calculation would practically require to be made.

There is one point in addition to be noticed in regard to the method of these calculations. Where property in two countries appears to be subject to a tax like probate duty or income tax on apparently much the same basis, the temptation is very strong to apply the calculated amount of such property per head to each nation respectively, but nothing could be more dangerous owing to the difficulty of the data. The laws and their administration of the respective countries compared would need careful examination before any such short cut could be used, and even then one ought not to be too sure of any single method. Unless some detail could be given, no such method should be employed except as a check on a more detailed method. Such a method is also specially dangerous when the wealth of a community is arrived at without any items being given; by such a method, for instance, as that of dividing the average wealth subject to probate duty in a year by the numbers dying in a year, assuming the wealth per head thus arrived at to be the average wealth per head of the community, and then multiplying the numbers of the community by that figure so as to arrive at the aggregate wealth. The method may yield useful results if care be taken to establish *aliunde* what is the relation between the wealth per head of those members of a community who die within a year and the wealth per head of the members of a community as a whole, but when no such care is taken, and communities are compared whose probate and income tax laws are not really the same, the result of the comparisons may be the merest chance.